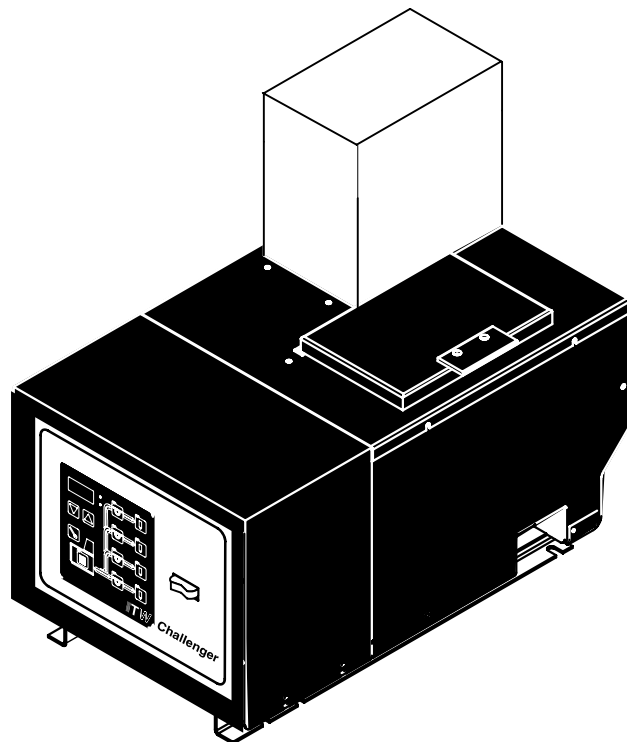




QUATTRO ADHESIVE SUPPLY UNIT OPERATIONS AND SERVICE MANUAL

with Software Version V1.05



IMPORTANT ! - READ ALL INSTRUCTIONS BEFORE OPERATING THIS EQUIPMENT

It is the customer's responsibility to have all operators and service personnel read and understand this information. Contact your ITW Challenger customer service representative for additional copies.

NOTICE! Please be sure to include the serial number of your application system each time you order replacement parts and/or supplies. This will enable us to send you the correct items that you need.

**ITW Challenger Service Parts Direct Dial: 1-800-538-9540
ITW Challenger Technical Service Direct Dial: 1-800-654-6711**



SAFETY INSTRUCTIONS

GENERAL CONSIDERATIONS

1. Read and follow these instructions. Failure to do this could result in severe personal injury or death.
2. Additional safety instructions and/ or symbols are located throughout this manual. They serve to warn maintenance personnel and operators about potentially hazardous situations.
3. Inspect the machine for unsafe conditions daily and replace all worn or defective parts.
4. Keep work area uncluttered and well lit.
5. All covers and guards must be in place before operating this equipment.

For precautions and definitions of safety symbols, refer to the Safety Chapter of the service manual.

SERVICING EQUIPMENT

1. Only trained personnel are to operate and service this equipment.
2. Never service or clean equipment while it is in motion.
3. Shut off the equipment and lock out all input power and air supply at their sources before attempting any maintenance.
4. Follow the maintenance and service instructions in the manual.

SIGNS

1. Read and obey all of the warning labels, signs and caution statements on the equipment.
2. Do not remove or deface any of the warning labels, signs and caution statements on the equipment.
3. Replace any warning labels, signs and caution statements which have been removed or defaced. Replacements are available.

ADDITIONAL CONSIDERATIONS

1. To ensure proper operation of the equipment, use specified electrical and/ or air supply sources.
2. Do not attempt to alter the design of the equipment unless written approval is received from our factory.
3. Keep all manuals readily accessible at all times and refer to it often for the best performance from your equipment.

TABLE OF CONTENTS

Chapter 1 Safety Precautions

Chapter - Page #

Chapter 2 Description & Specifications

Description	2-1
Specifications	2-2
Dimensions	2-4

Chapter 3 Installation & Start Up

Installation	3-2
Adding Adhesive	3-4
Changing the Adhesive Formula	3-4
Typical Start Up and Shut Down Procedures	3-5
Storage and Disposal of the Application System	3-6

Chapter 4 Temperature Controller Set-Up

Defining Temperature Control Terms	4-1
Error Indication Message	4-2
Firmware Chip and Checksum	4-2
Settings for a Typical Operation	4-3
System Values	4-3
Helpful Tips	4-4

Chapter 5 Programming of the Controller

Controller Keypad	5-1
Programming	5-1
Service Functions	5-4

Chapter 6 Preventive Maintenance

General Cleaning	6-1
Relieving System of Adhesive Pressure	6-1
Replacement of Manifold Filter Screen	6-2
Hose Fittings & Fasteners	6-2
Primary (Tank) Filter Inspection and Cleaning	6-3
Flushing the System	6-4

Chapter 7 Troubleshooting

General Troubleshooting	7-1
Handling Printed Circuit Boards	7-1
Control Printed Circuit Board	7-2
Overtemp Thermostat	7-3
Tank Overcurrent	7-3
Relay Contact to Parent Machine	7-3
Temperature Zones Not Heating	7-3
Location of PCB, Circuit Breakers, Overtemp Thermostat Re-set & RTD Sensor	7-3
Resistance Tables	7-4
Troubleshooting Guide	7-5
Piston Pump Troubleshooting Guide	7-9

Chapter 8 Disassembly & Re-assembly Procedures

Removing Access Panels & Covers	8-1
To Access Electrical Parts	8-2
To Access the Control Panel Components	8-3
To Remove Tank Lid	8-4
To Remove Tank Pressure Relief Valve	8-4
Piston Pump Removal	8-5
Re-assembly Procedures & Cautions	8-6

Chapter 9 Recommended Spare Parts & Available Kits

Recommended Spare Parts List	9-1
------------------------------------	-----

Chapter 10 Component Illustrations & Bills of Material

Cabinet Assembly	10-2
Tank & Base Assembly	10-4
Pump Assembly	10-6
Pump Air Manifold Assembly	10-8
Pump Air Manifold	10-9
Manifold Output Assembly	10-10
Filter Assembly	10-11
Valve Hose End Panel Assembly	10-12
PCB/ Heat Sink to Base	10-13

Chapter 11 System Schematics & Engineering Drawings

Hose Schematic: all models	11-1
Head Schematic: all models	11-2
Wiring Diagram	11-3

Chapter 1 SAFETY PRECAUTIONS

All operators and service personnel must read and understand this manual before operating or servicing equipment.

All maintenance and service on this equipment must be performed by trained technicians.

Electrical



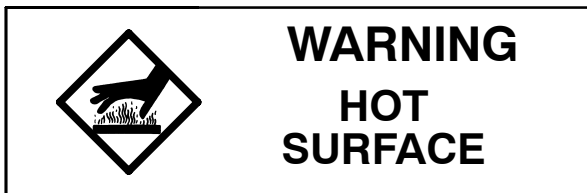
Dangerous voltages exist at several points in this equipment. To avoid personal injury, do not touch exposed connections and components while input

power is on. Disconnect, lockout and tag external electrical power before removing protective panels.

A secure connection to a reliable earth ground is essential for safe operation.

A disconnect switch with lockout capability must be provided in the line ahead of the unit. Wiring used to supply electrical power should be installed by a qualified electrician.

High Temperatures



Severe burns can occur if unprotected skin comes in contact with molten adhesive or hot application system parts.

Safety glasses, gloves and long-sleeved clothing must be worn whenever working with or around adhesive application systems.

High Pressure



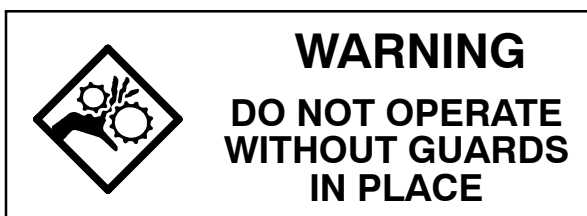
To avoid personal injury, do not operate the equipment without all covers, panels and safety guards properly installed.

To prevent serious injury from molten adhesive under

pressure when servicing the equipment, disengage the pumps and relieve the adhesive system's hydraulic pressure (e.g., trigger the heads, hand-held applicators, and/or other application devices into a waste container) before opening any hydraulic fittings or connections.

IMPORTANT NOTE: Even when a system's pressure gauge reads "0" psig, residual pressure and trapped air can remain within it causing hot adhesive and pressure to escape without warning when a filter cap or a hose or hydraulic connection is loosened or removed. For this reason, always wear eye protection and protective clothing.

Protective Covers



Keep all guards in place!

To avoid personal injury, do not operate the application system without all covers, panels and safety guards properly installed.

Eye Protection & Protective Clothing



It is very important that you PROTECT YOUR EYES when working around hot melt adhesive equipment!

Wear safety glasses with side shields which conform to ANSI Z87.1 or EN166.

Failure to wear safety glasses could result in severe eye injury.

It is important to protect yourself from potential burns when working around hot melt adhesive equipment.

Wear protective gloves and long-sleeved, protective clothing to prevent burns that could result from contact with hot material or hot components.

Always wear steel-reinforced safety shoes.

Safe Installation and Operation

To avoid possible failure of hoses, make sure all hoses are routed to avoid kinking, tight radius turns (8" or less) and abrasive contact. Hot-melt hoses should not have prolonged contact with heat-absorbing surfaces such as cold floors or metal troughs. These heat-absorbing surfaces can alter adhesive flow and cause incorrect calibration. Hoses should never be covered with materials that prevent heat dissipation, such as insulation or sheathing.

Read this manual before applying electrical power to the equipment. Equipment may be damaged by incorrect electrical connections.

Do not use adhesive that is dirty or that may be chemically contaminated. Doing so can cause system

clogging and pump damage.

When adhesive hand-held applicators or other movable applicators are used, never point them at yourself or at any other person. Never leave a hand-held applicator's trigger unlocked when not actually in use.

Do not operate the hopper or other system components without adhesive for more than 15 minutes if the temperature is 150 degrees C (300 degrees F) or more. To do so will cause charring of the residual adhesive.

Never activate the heads, hand-held applicators and/ or other application devices until the adhesive's temperature is within the operating range. Severe damage could result to internal parts and seals.

Treatment for Burns From Hot Melt Adhesives

Burns caused by hot melt adhesive must be treated at a burn center.

Care should be used when working with hot melt adhesives in the molten state. Because they rapidly solidify, they present a unique hazard.

Even when first solidified, they are still hot and can cause severe burns. When working near a hot melt

application system, always wear safety gloves, safety glasses and long-sleeved, protective clothing.

Always have first-aid information and supplies available.

Call a physician and/or an emergency medical technician immediately.

Service

Refer all servicing to qualified personnel only.

Explosion/ Fire Hazard

Never operate this unit in an explosive environment.

Use cleaning compounds recommended by ITW Challenger or your adhesive supplier only. Flash points

of cleaning compounds vary according to their composition, so consult with your supplier to determine the maximum heating temperatures and safety precautions.

Lockout/ Tagout

Follow OSHA 1910.147 (Lockout/ Tagout Regulation) for equipment's lockout procedures and other important lockout/ tagout guidelines.

Be familiar with all lockout sources on the equipment.

Even after the equipment has been locked out, there may be stored energy in the application system, particularly in the capacitors within the panel box. To ensure that all stored energy is relieved, wait at least one minute before servicing electrical capacitors.

Use of PUR (Polyurethane) Adhesives

PUR adhesives emit fumes (MDI and TDI) that can be dangerous to anyone exposed to them. These fumes cannot be detected by the sense of smell. ITW Dynatec strongly recommends that an exhaust hood or system be installed over any PUR system.

Consult with your adhesive manufacturer for specifics about required ventilation.



CAUTION: Because of the nature of PUR adhesives to strongly bond in the presence of moisture, care must be taken to prevent them from curing inside Dynatec equipment. If PUR adhesive solidifies in a unit, the unit must be replaced. Always purge old PUR adhesive from the system per your adhesive manufacturer's instructions and timetable. ALLOWING PUR ADHESIVE TO CURE IN A UNIT VOIDS ITW DYNATEC'S WARRANTY.

In This Manual

WARNINGS and CAUTIONS are found throughout this manual.

WARNINGS mean that failure to observe the specific

instructions may cause injury to personnel.

CAUTIONS mean that failure to observe the specific instructions may damage the equipment.

Chapter 2

DESCRIPTION AND SPECIFICATIONS

Description

The ITW Challenger Quattro adhesive supply unit (ASU) is a computer-controlled hot-melt supply unit designed on metric standards. Its “all-icon” control panel is internationally operator friendly.

The Quattro ASU uses a microprocessor temperature control to closely control the temperature of hot-melt adhesive for a tank and up to four hoses and four heads. Temperature setpoints are operator-selected for up to nine zones and the system automatically provides warnings for operator errors and system malfunctions.

The system provides accurate, proportionate temperature control for the tank, hoses and applicators. Sequential heating delays may be programmed for turn-on of the hoses and heads. A “standby” temperature may be programmed so that the temperature zones can be maintained at a lower temperature when the ASU is not in active use, enabling rapid return to normal operation.

With these flexible temperature programming features, the Quattro system increases adhesive life by eliminating prolonged high adhesive temperatures. It reduces energy consumption and brings the system up to normal operating temperatures in the shortest possible time.

The temperature control can interlock the parent machine with preselected adhesive temperatures so that production automatically begins when adhesive temperatures are correct for the application. All system temperature values can easily and quickly be programmed.

The ASU uses an extremely dependable, constant-pressure piston pump. The air-operated pump insures a high pressure adhesive output from a low pressure, compressed air input.

Quattro’s teflon-coated tank accepts adhesive in all popular forms, including pellets, slugs and blocks. The ASU can accomodate air-actuated automatic applicators (heads), electric applicators, hand-held applicators and/or special applicators.

Power supply	230 VAC, 1 PH
	230 VAC, 1 PH with neutral
	230 VAC, 3 PH, Delta
	230/ 400 VAC, 3 PH, Wye
Tank wattage	1800 watt @240 VAC
Power consumption, system maximum	30 amp (7200 watts @240 VAC)
Maximum current available for each hose & head combined	6 amp standard (1400 watts @240 VAC)
Temperature control	microcontroller
Temperature sensors	Ni120 Ohm RTD standard
Electrical connectors	durable, latching connectors

Pressurized Air:

Air pressure supply	1.4 to 6.8 bar (20 to 100 psig)
Air consumption at 60 pump cycles per minute	90 normal liters/ minute (3.2 SCFM at 100 psig)

Performance:

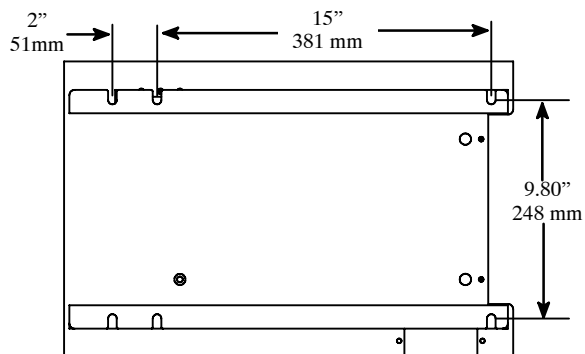
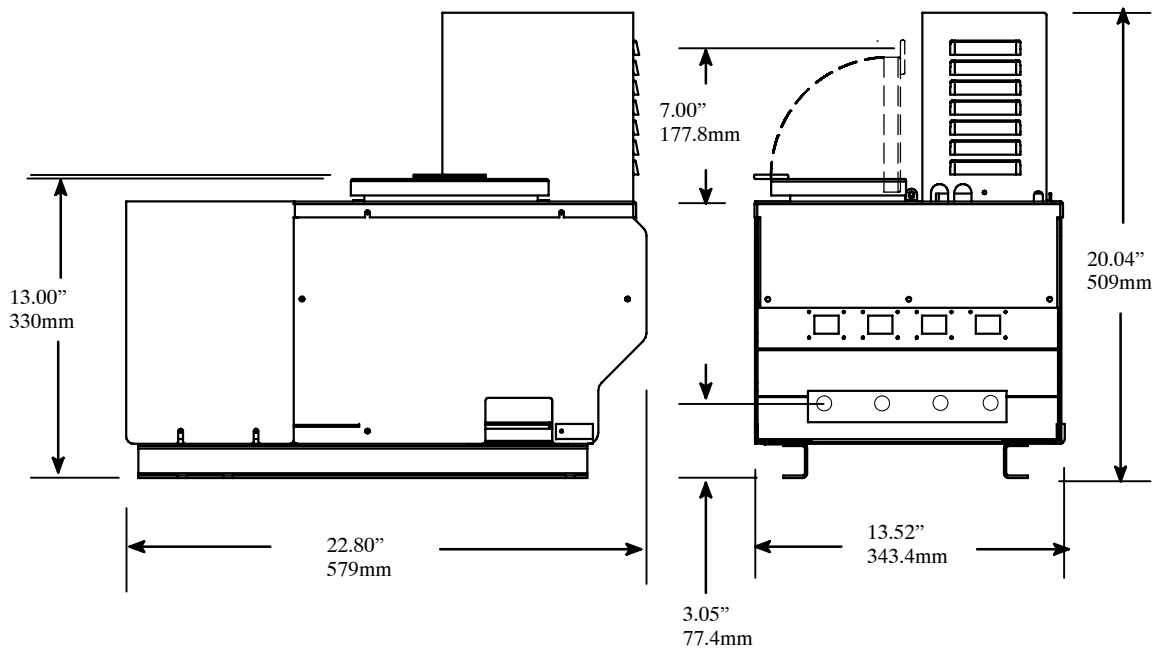
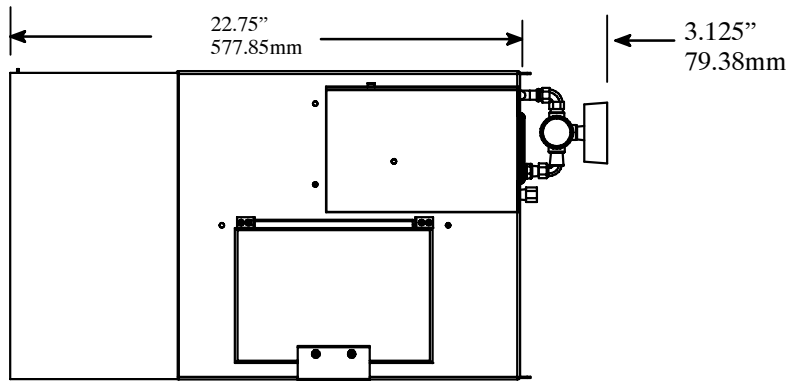
Adhesive temperature control range	40°C to 218°C (100°F to 425°F)
Adhesive temperature control accuracy	± 1°C (± 1°F)
Over-temperature cutoff for tank	232°C (450°F)
Adhesive viscosity	500 to 30,000 centipoise
Warm-up time, full tank	approximately 0.5 hour
Adhesive melt rate (depends on adhesive used)	9.1 kg/hr (20 lb/hr)
Adhesive pressure	up to 97 bar (1400 psi) maximum
Maximum pump speed, piston pump	60 pump cycles per minute
Adhesive delivery rate, open line	0.87 kg/min. (1.92 lb/min.)

Temperature Controller:

Controller board	1 board, modular construction
Display type	long-life, bright LED
Temperature control zones	9
Fuses	all fuses are size 5mm x 20mm
	hose/ applicator head: 6.3 amp fast open
	transformer: 1 amp
	tank: 15 amp circuit breaker

Other:

Operator interface	digital display with simplified, all-icon keypad
Temperature standby	yes
High & low temperature tolerance	yes
Ready interlock contact	yes
Sensor open alarm	yes
CE approval granted	yes



Mounting Hole Dimensions

Installation Dimensions

Chapter 3 INSTALLATION & START-UP

Mounting the QUATTRO ASU

The Quattro adhesive supply unit (ASU) can be mounted on most flat surfaces, on either an open or a solid frame (as shown below). An open frame is preferred for easy service. The main electrical power comes in at the front left corner of the base of the unit and connects behind the keypad. Access to the underside of the ASU is not a necessary consideration in mounting the unit.

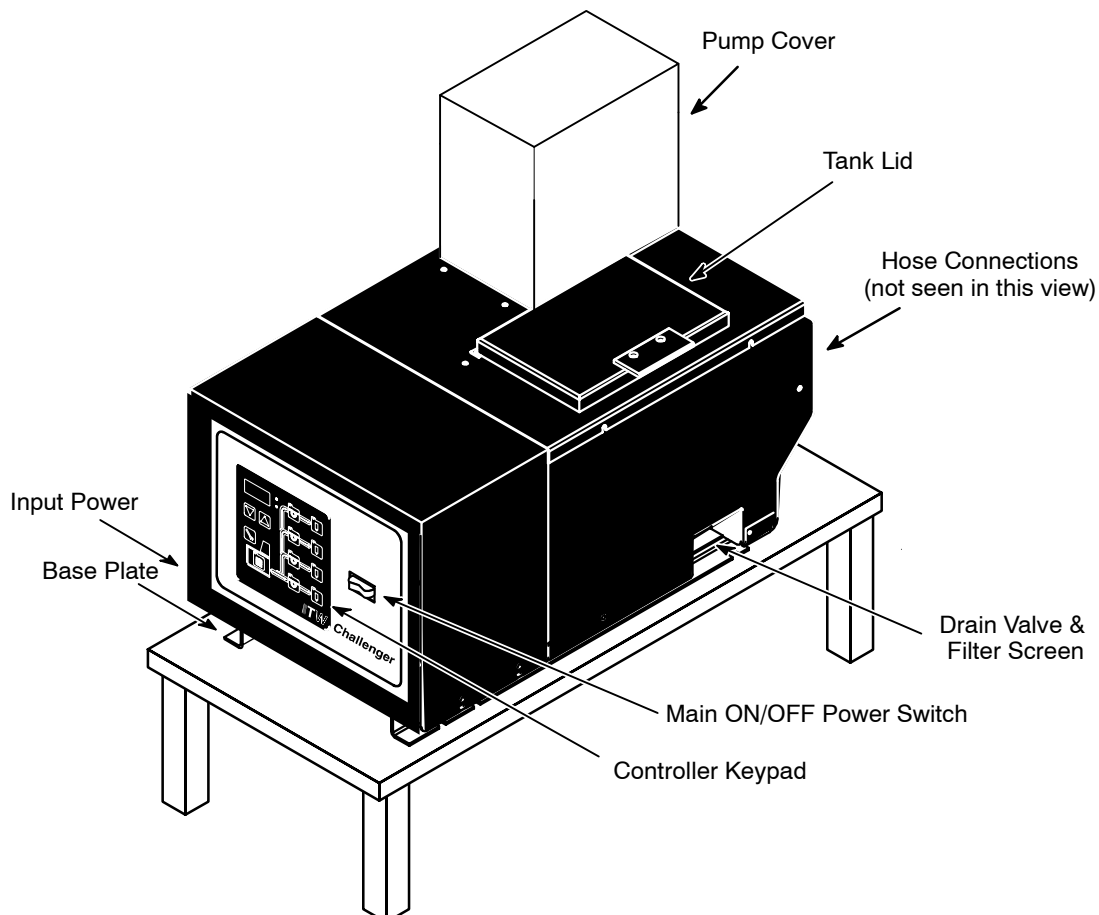
For installation dimensions, see illustration on page 2-4.

Lifting the ASU



WARNING

The unit must be lifted by two persons, using proper lifting technique, one person at either end. Securely hold it under its base plate. No belts or hooks should be used. Never allow anyone to stand on the ASU.



Components of the Quattro ASU

Installation

NOTE: Re-read Chapter 1 “Safety Precautions” before performing any installation procedures. All installation procedures must be performed by qualified, trained technicians.

After the Quattro ASU has been properly mounted, the following general sequence should be followed for installation:

1. Make sure that incoming line power to the ASU and the unit’s main power switch are turned OFF.



DANGER HIGH VOLTAGE

A lockable power disconnect switch with overload protection must be provided by the customer as part of the ASU installation. The disconnect must isolate the ASU from its power source.



DANGER HIGH VOLTAGE

Disconnect and lockout input power to the application system before starting any installation procedures. Make sure there is no electrical power on the leads you will be connecting.

2. Your power supply should be rated for 30 Amp service and should include an earth ground conductor.



CAUTION: Grounding conductors never carry electrical current. The use of a neutral conducting wire as earth ground is incorrect and may cause damage to the controller.

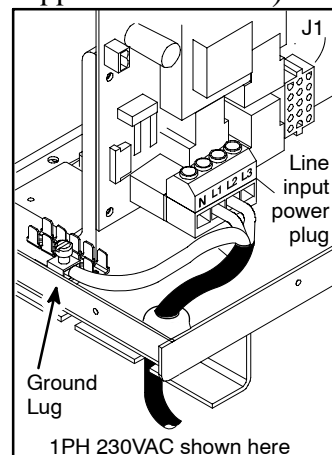
3. Make two connections to the printed circuit board: Remove control panel enclosure by loosening the six screws in notched positions on the enclosure, then lifting up the enclosure.

- a. Select proper power configuration plug for your system (four plugs are shipped with the unit):



CAUTION: Using the incorrect power configuration plug may cause serious damage to the unit.

- for 230 VAC, 1PN system = use PN 110763 white plug with light blue wire
- for 230 VAC, 1PH with neutral = use PN 110764 white plug with black wire
- for 230 VAC, 3PH, Delta = use PN 110765 white plug with violet wire
- for 230/ 400 VAC, 3PH, Wye = use PN 110766 white plug with yellow wire

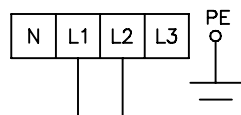


- b. Insert proper power configuration plug into socket J1 at bottom, center of control printed circuit board located within the control enclosure (see illustration of PCB in Chapter 7 for location).

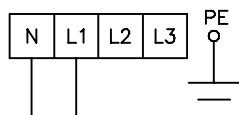
- c. Wire main power into Line Input Power Plug and the ground lug (to the left of board). Main power connections & the ground lug are at the bottom, left of the PCB (X1). Conduit fitting or cable grip not supplied.

cont.

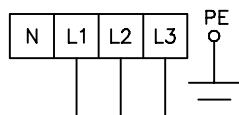
LINE INPUT POWER PLUG WIRING FOR EACH TYPE POWER SUPPLY:



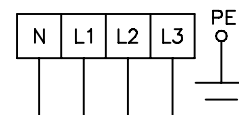
1PH 230VAC



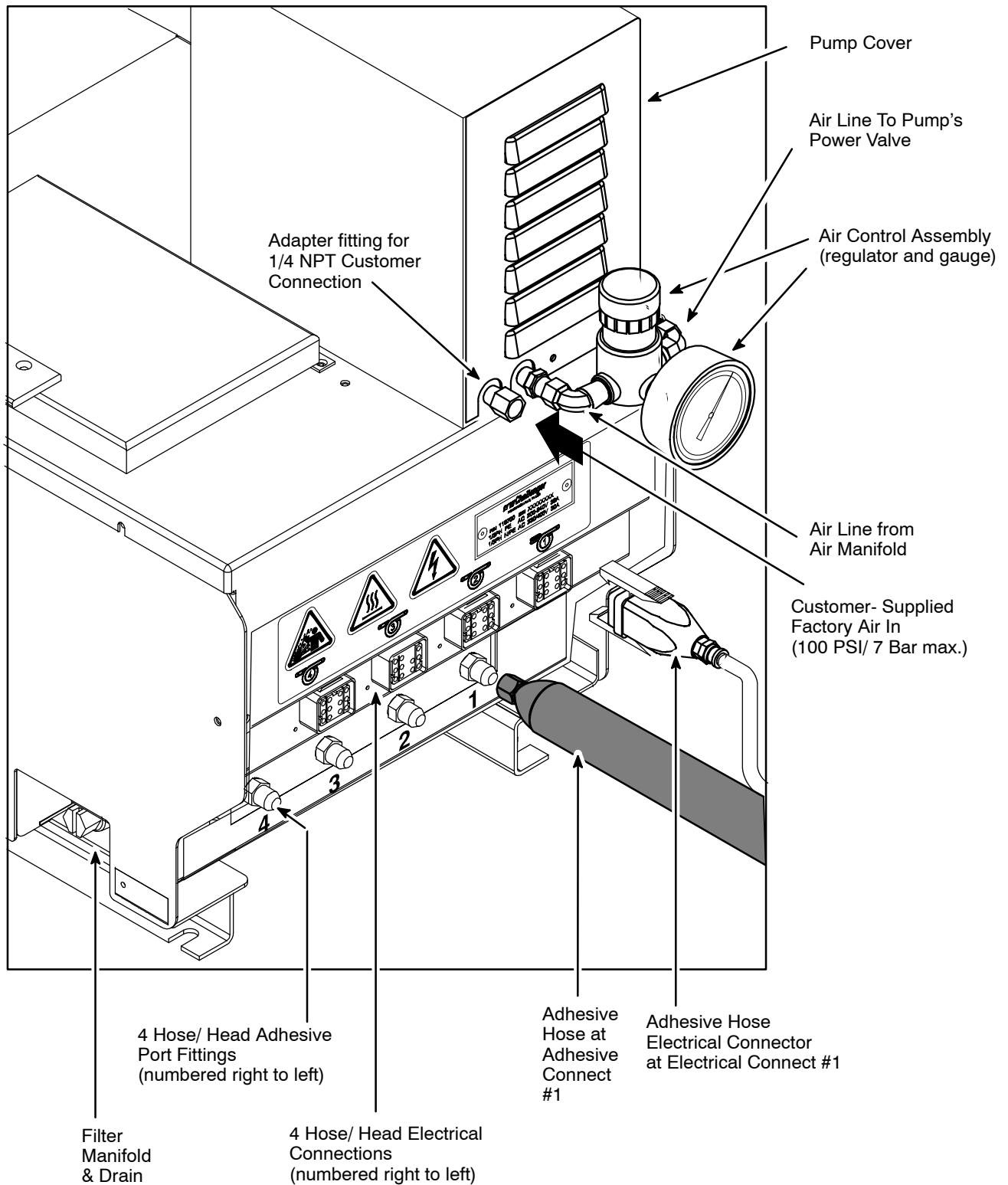
1PH + N 230VAC



3PH 230VAC DELTA



3PH 230/400VAC WYE



Hose End Panel: Hose/ Head & Air Connections

4 a. Connect a compressed air supply (100 psi/ 7 bar max.) to the air regulator using a 1/4 R (BSPT) male connector filling.



CAUTION: The compressed air supply must be clean and dry. NEVER use lubricated oil. Use of an air line filter may be required to remove moisture and lubrication from the air supply.

b. The air control regulator has a locking cap. Lift the cap up, then turn clockwise to increase pressure. A counter-clockwise turn decreases pressure. The recommended pressure is 1.4 to 6.8 bar (20 to 100 psi).

5. The adhesive hoses are connected at the hose end panel (see illustration on page 3-3). You must make both an electrical and an adhesive flow connection. The electrical hose connections are at the four numbered rectangular receptacles on the hose end panel.

The hose adhesive ports are located below the electrical connections. They are numbered (1-4) from right to left. There are four ports (fittings) for the use of up to four hoses.

When making hose connections, follow the number guide label on the ASU above the hose socket; ie. when using one hose make your hookup to electrical connection #1 and adhesive port #1. When using two heads/ hoses, connect hose/ head #1 to electrical connection #1 and adhesive port #1, then hookup hose/ head #2 to electrical connection #2 and adhesive port #2. In a similar manner, connect a third and a fourth hose/ head if desired.

Route hoses so that there is at least an eight-inch radius at any bend. Do not hang hoses without proper support. Do not crimp, clamp, squeeze or tie hoses. Refer to the hose and applicator manuals for further details on these items.

Adding Adhesive



WARNING HOT ADHESIVE

Do not overfill the melt tank since adhesive generally expands as it melts and a full tank may overflow.



CAUTION: Using adhesive with viscosity over 50,000 centipoise may cause the pump to stall.

The adhesive level should be maintained at 13mm to 50mm (1/2" to 2") from the top of the tank. Where applications demand a high output volume of adhesive, add small amounts of adhesive frequently. Adding large amounts of adhesive to an almost empty tank will lower the temperature of the adhesive in the tank and may cause the ASU to fall below its READY setpoint.

Changing the Adhesive Formula

If a different adhesive formulation from the one being currently used is needed, the system will have to be flushed if the two formulations are incompatible. See page 6-4 of this manual for the proper flushing procedure. When in doubt about adhesive compatibility, flush your system.

Typical Start-Up and Shut Down of the Application System

Start Up Procedures

1. Fill the ASU's tank with clean hot-melt adhesive as described on page 3-4. Close the tank lid immediately to prevent contaminants from falling in. (Cover your bulk supply of adhesive to prevent contaminants also.)
2. At the control panel, turn ON the Main Power Switch. The controller will perform its initial calibration cycle. The display will read "CAL". All of the nine temperature zone's LEDs will flash as a lamp test.
3. Program your adhesive setpoints (see instructions in Chapter 5) or use the factory settings listed below. Allow adequate time (approximately 20-30 min.) for the adhesive to melt and the temperatures of the temperature zones to stabilize.

Note: When the ASU leaves the factory, it is programmed with the following factory settings (unless special factory settings were requested):

Tank:	177°C (350°F)
Hose:	177°C (350°F)
Applicator:	177°C (350°F)
Sequential Startup:	OFF

4. Once the ASU has reached temperature, the ASU will automatically begin to pump adhesive.
5. Use the air pressure regulator, located at the rear of the ASU, to regulate pump speed and adhesive output.

Shut Down Procedures

1. Turn OFF the Main Power Switch.

Storage and Disposal of the Application System

Temporary Storage of the Unit

1. Flush the adhesive application system with flushing fluid (PN L15653), following the instructions detailed in chapter 6 of this manual.
2. Clean or replace both the applicator filter and the ASU manifold filter screen, following instructions detailed in chapter 6.
3. Shut OFF all pressure and power sources.
4. Release residual air pressure.
5. Remove all residual adhesive and wipe components clean.
6. Remove all air lines and all power supply cables.
7. Pack the unit in a corrosion-proof manner.
8. Store the unit in such a way that it is protected from damage.

Disposal of the Unit

1. Shut OFF all pressure and power sources.
2. Release residual air pressure.
3. Remove all residual adhesive.
4. Remove all air and adhesive supply hoses and all power supply cables.
5. Dismantle all components and sort into mechanical and electrical components.
6. Arrange for all components to be recycled.

Chapter 4

TEMPERATURE CONTROLLER SET-UP

Temperature Control Functions in General

The Quattro temperature controller provides accurate temperature control for the tank, hoses and applicators. Setpoints are programmed at the user-friendly, all-icon keypad. The controller will display an error message any time an open or shorted sensor condition occurs.

Defining Temperature Control Terms

Adhesive Temperature Control Range

The temperature limits within which the ASU, hoses and applicators may be programmed and maintained.

Alarm Signal

The controller provides an alarm signal if any zone has a critical situation. This signal is available on a dry contact located at connector X7 on the Control printed circuit board.

CPU Module

The central processing unit (CPU) of the microprocessor temperature control.

Temperature Controller

The built-in control system that controls, monitors and displays all system temperature values of the Quattro adhesive application system.

Control PCB

The printed circuit board (PCB) of the ASU. It provides control signals to, and monitoring signals from, the tank, hoses and applicators. It features lighted LEDs to indicate that heater power is ON. The ASU's fuses, circuit breakers & power configuration plug are located on this board.

Keypad Locking

The controller's keypad may be locked (or unlocked) to restrict (or allow) further programming.

Mechanical High-Temperature Protection

A mechanical, redundant thermostat located on the tank that will turn off the system above safe temperatures

RTD Sensors

The system uses 120-ohm Nickel resistance temperature detector (RTD) sensors for all temperature controls.

Ready Signal

The controller provides a ready signal if all temperature zones are within a programmable tolerance and the system is ready for production. This signal is available on a dry contact at connector X8 on the Control printed circuit board. The ready signal also controls pump operation.

Sequential Startup

This feature allows the temperature zones to come on in sequence (tank, followed by hoses and heads). When activated, and the ASU is turned ON from a cold start, the tank heats first. When the tank is within its setpoint tolerances, the hoses and heads begin to heat.

Setpoint

A programmable temperature that has been selected for tank, hoses and applicators.

Setpoint Limitation

This is a universal maximum temperature for all zones (218°C [425°F]). The programmer cannot program a temperature setpoint higher than the setpoint limitation.

Standby (Setback)

During breaks or delays in production, it is possible to reduce the temperature of all zones by a specified amount through programming of a standby. The programmed standby (also referred to as “setback”) is the difference in temperature by which all zones will reduce below their setpoints when standby is activated. Standby is always OFF when the ASU is turned ON. In standby mode, the ready signal is OFF and the pump will stop.

Error Indication Messages

A controller display of “EO1” indicates that the selected zone (ie, a hose, applicator or the tank) has an open sensor. A display of “EO2” indicates a shorted sensor.

If either alarm occurs, first verify that the following three connections are made correctly:

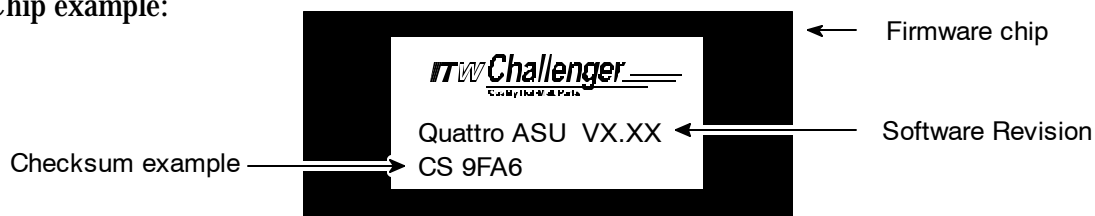
1. The ASU-to-hose connection(s) located at the back of the ASU,
2. The hose-to-applicator connection(s),
3. The RTD Input connections (X4 & X5) located on the Control Printed Circuit Board.

If the problem is not with a connection, check the sensor and replace if necessary.

Firmware Chip and Checksum

The firmware chip is on the Control Printed Circuit Board (see Ch. 7). Inscribed on the controller’s chip is information that is required if your controller needs service, including the controller’s checksum and software revision.

Chip example:



System Values That Are Permanently Programmed

- Minimum setpoint value: 40°C (100°F).
- Maximum setpoint value: 218°C (425°F).

System Values as Programmed by the Factory

ITW Dynatec can set the controller's system values to customer's specs, if provided.

If customer's specs are not provided, the following values will be entered into the temperature controller at the factory. They may be changed by reprogramming through the keypad.

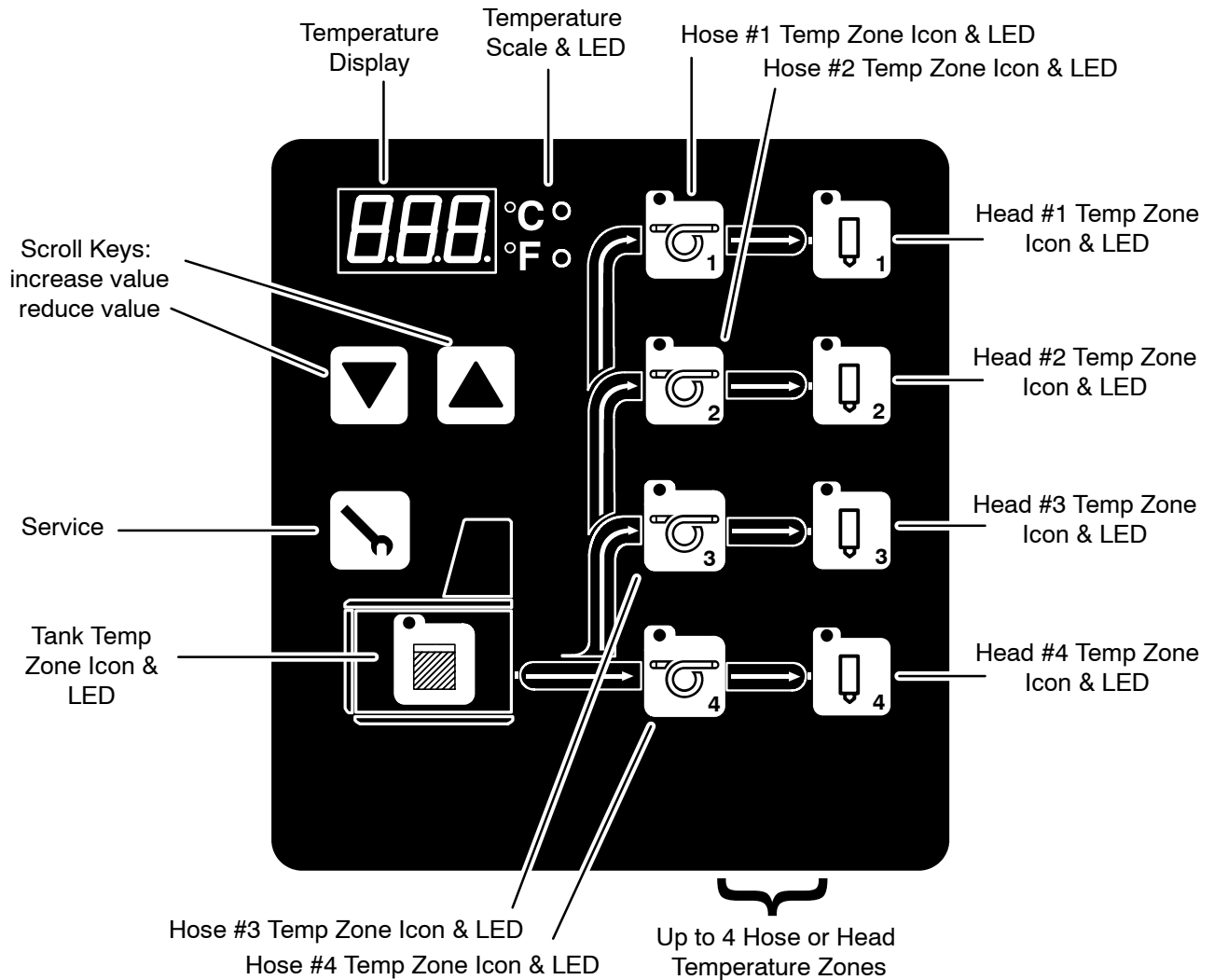
- Temperature scale: displayed in degrees Fahrenheit
- Applicator (head) and hose setpoints: OFF
- Tank setpoint: 177°C (350°F)
- All zones are switched off, except for the tank
- Access Code: not active
- All programmable time delays: set to zero (0)
- Tolerance range for high & low temperature limits: $\pm 27^{\circ}\text{C}$ ($\pm 50^{\circ}\text{F}$)

Helpful Tips for the User

- When the ASU is turned on, all temperature setpoints and other operating parameters will be exactly where they were when the ASU was turned off.
- When the ASU is turned on, all system heaters go on unless they have previously been set below 40°C (100°F).
- When the ASU is turned on, the controller checks all RTDs. If a zone does not have a valid RTD, this zone will be switched off.

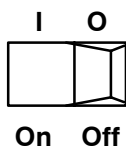
Chapter 5 PROGRAMMING INSTRUCTIONS FOR QUATTRO CONTROLLER

Quattro Keypad



Programming

Turn Controller ON



Turn ON the main power switch.
System will go through its self-diagnostics (CAL).
Controller will display "CAL".
Temperature zone LEDs will flash.

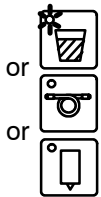
Controller will display "SS 1" (On) or "SS 0" (Off) to indicate status of the Sequential Statup feature (see info on "Sequential Startup" later in this chapter).



or

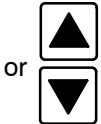


Programming Temperature Setpoints



Choose a temperature zone.

When flashing, the zone's setpoint is displayed, and it can be programmed.

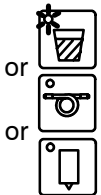


In order to program the temperature setpoint, scroll up to increase value or down to reduce value.



After two seconds the display will read the actual temperature. The setpoint is stored.

Turning Temperature Zones ON/ OFF



Choose a temperature zone.



Scroll to reduce value until the temperature setpoint shows " - - - ". This temperature zone is now turned OFF.



To turn ON the temperature zone, increase the setpoint.

When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

Keypad Locking

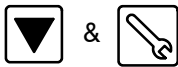
It is possible to lock or unlock the controller in order to restrict programming changes. To change the code which is necessary to over-ride or unlock the keypad lock, see Service Functions.

Note: the Quattro is shipped with de-activated keypad lock. If the keypad lock must be used, an access code must be programmed prior to locking the keypad.

Locking or Unlocking the Keypad

Important Note: the controller must be in the Temperature Display mode in order to allow locking or unlocking of the keypad.

Locking the Keypad

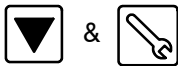


Press the Down Scroll key, then hold and press the Service icon key.

You will see "Loc" to indicate that the Keypad Lock is active.

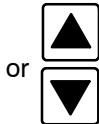


Unlocking the Keypad



Press the Down Scroll key, then hold and press the Service icon key.

You will see "Cod" to indicate that the access code is required.



or

Enter your access code by scrolling up or down. Default code = " - - -".



Confirm your code input by pressing Tank key.

Notes:

1. Once the keypad lock is active, unauthorized programming is not possible, even after turning the ASU OFF, then back ON again.
2. Once the keypad lock is unlocked, programming is possible until the ASU is turned OFF, then back ON or the keypad is locked again.
3. If the keypad must be unlocked permanently, the access code must be de-activated in the Service Functions.

Service Functions

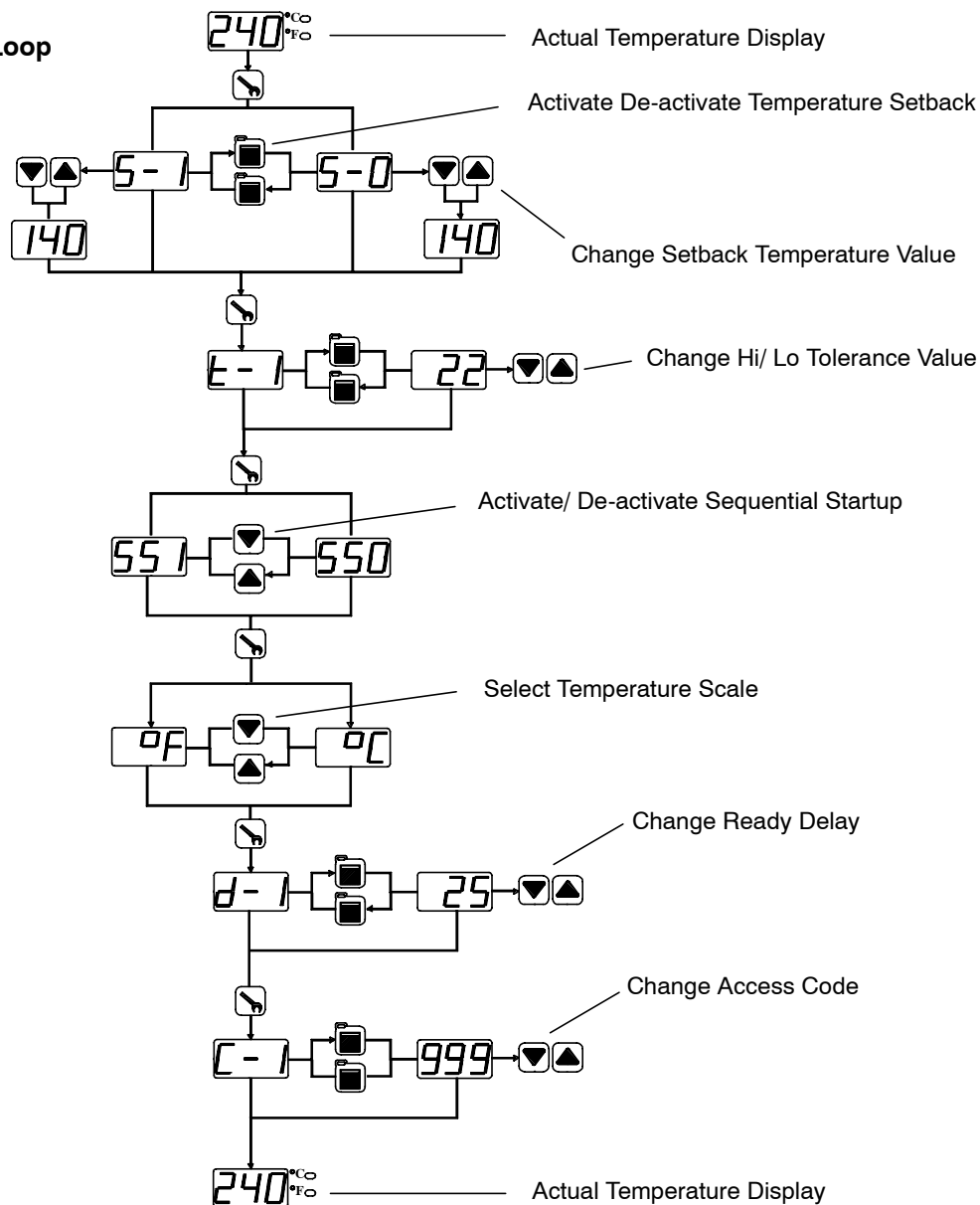
After the basic programming of Temperature Setpoints is complete, the programmer proceeds to programming of the Service Functions, if desired.

The Service Functions are a continuous loop of programming steps ("functions") which the programmer moves through by pressing the "Service" key. These steps are described in this section of the chapter. The Service Functions loop and basic programming is diagrammed below.

There are three ways to exit the Service Functions loop:

1. Just wait (approx. 10 seconds) and the controller will automatically return to the actual temperatures display,
2. Press the Service key until you are back to the actual temperatures display, or
3. Press any Hose or Head key and you will return to the actual temperatures screen.

Diagram of the Service Functions Loop



Service Functions, cont.

Standby Programming

“Standby” is a temperature value by which all temperature zones will lower when Standby mode is activated. For example, if your temperature setpoints are all 300 degrees, and you program a 100 degree Standby, then the Standby temperature of all zones will be 200 degrees. Similarly, if your temperature zones setpoints vary, and you program a 100 degrees Standby, each zone’s Standby temperature will be 100 degrees lower than its setpoint.



Press Service icon to enter Service Functions.

You will see either “S-1” (standby is On) or “S-0” (standby is Off).



or



Press the Tank icon to activate/ de-activate Standby.



If desired, you may set the Standby temperature by scrolling up or down to desired temperature.



When programming is complete, wait a few seconds and the controller will return to the ASU’s actual temperature.

Note: When Standby is active, the display will alternate between the ASU’s actual temperature and S-1.

Service Functions, cont.

To Set Tolerance (Hi & Low Temperature Limits)

The Tolerance (high/ low alarm) setpoint is a range (+ and - the zone's temperature setpoint) between which your ASU can safely operate. It's lower temperature represents the ASU's ready temperature. It's upper value represents the over-temperature point.

Setting the Tolerance range, for example: if the temperature setpoint is 200 degrees, and the Tolerance setpoint is 10 degrees, then the high alarm (overtemp) equals 210 degrees and the low alarm (ready temp) equals 190 degrees.



Press the Service icon twice to select the Tolerances of your temperature zones. An display of "t-1" indicates the Tolerance function has been selected.



Press the Tank button to display the Tolerance.



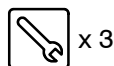
or

Use the scroll buttons to change the Tolerance range for all zones.
Note: your Tolerance range must be a value between ± 50 degrees for Fahrenheit (± 27 degrees for Celsius).

When Tolerance programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

Turning Sequential Startup ON/OFF

The Sequential Startup feature programs the order in which the temperature zones will come on at startup. A Sequential Startup of "SS1" (On) means the tank will begin heating first, then, when the tank is ready, the other zones will begin heating. A Sequential Startup of "SS0" means Sequential Startup is Off and all zones will begin heating immediately.



Press the Service icon three times to set Sequential Startup.

The display will flash either "SS1" (sequential startup is ON) or "SS0" (sequential startup is OFF).



or



or

Scroll to choose between ON and OFF. When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

Note: Any time the ASU is switched ON, you will briefly see "SS1" or "SS0" displayed.

Service Functions, cont.

To Set Temperature Scale

The Temperature Scale may be set to display temperature either in degrees Celsius or Fahrenheit.



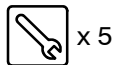
Press the Service icon four times to set the Temperature Scale.



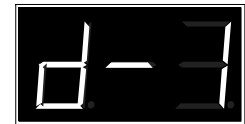
Scroll to choose between Celsius ("C") or Fahrenheit ("F") as indicated by the Temperature Scale LED. When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

To Set Ready Delay

When the system is ready (all temperature zones are within tolerance), a ready delay may be programmed to delay the system's ready output signal.



Press the Service icon five times to set a Ready Delay.



You will see "d-1" to indicate you are in Ready Delay programming mode.



Press the Tank icon to display the Ready Delay.



To change a Ready Delay, scroll up or down to the desired length (in minutes) of delay.

0 = Default, no delay

99 minutes = maximum length of delay

When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

Service Functions, cont.

To Change Access Code (De-activate Keypad Locking)



x 6

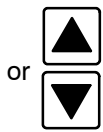
To change the Access Code, press the Service icon six times.



You will see "C-1" to indicate you are in Access Code programming mode.



Press the Tank icon to see the programmed Access Code. For example, "999".



To change the Access Code, scroll up or down to the desired numeric value.



" - - - " = no Access Code (Access code is de-activated),

" - - - " = no Keypad Locking

1 - 999 = possible Access Code values

When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

Controller Features

System Ready Indicator Light

When not in programming mode, a flashing temperature scale light (LED) indicates that the ASU is not “Ready” for production. This LED will cease to flash when all temperature zones are within the programmed temperature tolerance window.



Error Indication Messages

“EO1” = the temperature sensor is open (no sensor attached) or has high resistance.



“EO2” = the temperature sensor is shorted or has low resistance.



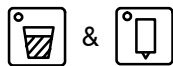
To Copy and Paste Setpoints

The Copy/ Paste feature of the controller copies the tank setpoint and pastes it as the setpoint of other temperature zones. The paste will apply to only temperature zones that are switched ON.

Set your Tank setpoint as described earlier in this chapter.



Push and hold the Tank icon. While holding, press the #1 Hose icon. Release.



Push and hold the Tank icon again. While holding, press the #1 Head icon. Release.

The manually programmed setpoint has now been pasted in to all turned on hose and head zones. When programming is complete, wait a few seconds and the controller will return to the ASU's actual temperature.

Chapter 6 PREVENTIVE MAINTENANCE



Note: Re-read Chapter 1 “Safety Precautions” before performing any maintenance procedures. All maintenance procedures must be performed by qualified, trained technicians.

General Cleaning

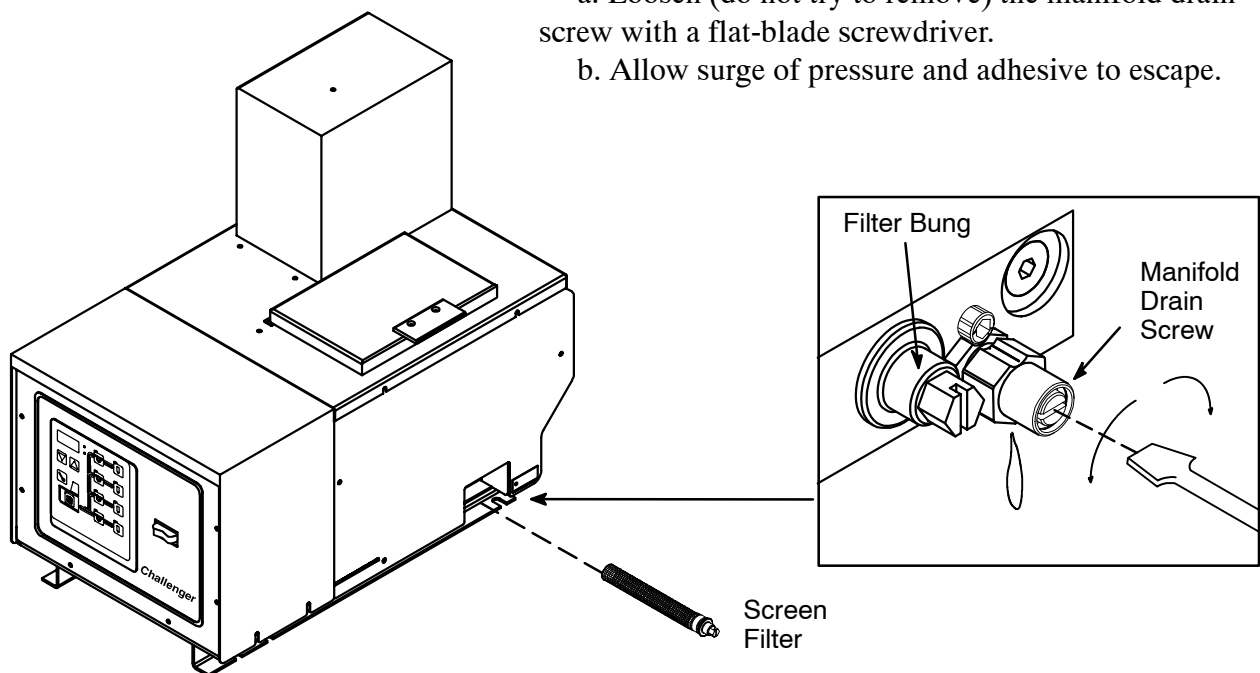
Follow the manufacturer’s directions when using industrial cleaners on the enclosure.

Relieving the System of Adhesive Pressure

As a safety precaution, relieve pressure in the outlet manifold before changing the filter or before removing any of the hoses or applicators from their manifold port.

WARNING	
	HIGH PRESSURE During the pressure relief procedure, hot adhesive will come out of the manifold. Wear safety glasses, gloves and protective clothing. Stand clear of the ASU until all pressure is relieved.
	HOT ADHESIVE Avoid splashing hot adhesive. Position a heat-resistant container under the manifold drain before proceeding.

1. The system should be at operating temperature. Turn the pump/ motor OFF. Lock out power.
2. Trigger one or more applicators into a heat-resistant container until all adhesive flows out.
3. Relieve pressure at the manifold drain:
 - a. Loosen (do not try to remove) the manifold drain screw with a flat-blade screwdriver.
 - b. Allow surge of pressure and adhesive to escape.



Replacement of the Manifold Filter Screen

During the first weeks of operation, the filter screen must be replaced or cleaned weekly to remove foreign and charred material. When replacing filter, wait until tank is empty or near empty.

1. Follow instructions and warnings for “Purging the Filter Manifold of Adhesive and Pressure”, page 6-1.
2. Reduce pump air pressure to 0 psi by fully turning air regulator counter-clockwise. Trigger all applicators.
3. Place a heat-resistant container beneath the drain valve, then turn open valve by turning counter-clockwise with a flat-blade screwdriver.
4. Turn air regulator clockwise slowly until a steady stream of material flows from the valve.
5. Again, reduce air pressure to 0 psi by fully turning air regulator counter-clockwise.
6. Using a large, flat-blade screwdriver, loosen the filter bung. Pull filter assembly out of ASU (see illustration on previous page).
7. Remove screw from filter assembly and separate filter screen from assembly.
8. Clean the filter plug of any char or debris.
9. Examine the o-rings the filter bung and replace if necessary. Apply o-ring lubricant to new o-ring.
10. Install new filter screen*, reassemble and apply anti-seize to the threads of the filter bung.
11. Slide assembly back into the ASU. Tighten assembly into ASU.
12. Turn the drain valve clockwise to close. Tighten the assembly. Do not over-tighten.
13. Restore the ASU to operating pump pressure.

*Note: if not damaged, the filter may be cleaned instead of replaced. Disassemble as above and use Flushing Fluid and a non-abrasive brush on the filter screen.

Hose Fittings & Fasteners

Periodically check all hose fittings and screws for tightness.

Primary (Tank) Filter Inspection & Cleaning

The primary filter is a coarse L-shaped screen located in the bottom of the tank. It fits around the tank's drain hole and prevents any large debris from entering the pump.

1. Pump all adhesive out of the ASU.
2. Open the tank lid and inspect the tank filter.



WARNING HOT SURFACE

The ASU will still be hot during this procedure. Use insulated gloves and protective clothing when handling the tank filter.

3. Use a hook or a pair of pliers to pull the tank filter out.
4. Immerse the clogged filter in flushing fluid (PN L15653), then use a hot air gun and rags to clean it.
5. Remove any accumulation of debris from the floor of the tank before re-installing tank filter.
6. Re-insert the filter into the tank.
7. Refill the tank and resume production.

Flushing the System

Contaminated adhesive, accumulation of residue and debris, or changing the adhesive formulation may require the system to be flushed. At least 6 liters (1.5 gallons) of flushing fluid is required (PN L15653).



WARNING, HOT ADHESIVE



The flushing fluid will splash easily. Wear protective clothing, gloves and goggles to prevent severe burns.

1. Pump out as much of the molten adhesive as possible.
2. Purge the manifold, following the instructions given in “Purging the System of Adhesive and Pressure” on page 6-1.
3. Disconnect one of the supply hoses from its applicator head. Put the hose in a secured position within a container to catch the used flushing fluid.
4. Add flushing fluid to the tank and allow approximately fifteen minutes for it to reach tank temperature. Carefully stir the flushing fluid to mix with any remaining adhesive.
5. Slowly turn the air pressure regulator clockwise.
6. Pump the fluid into the container.
7. Turn the regulator counter-clockwise to reduce air pressure to zero.
8. Remove the manifold filter and replace it (following instructions given in “Replacement of the Manifold Filter” on page 6-2). Install new o-rings and install filter.
9. Add new adhesive to the tank and heat to application temperature.
10. Slowly turn the air pressure regulator clockwise to increase air pressure.
11. Actuate each applicator until all flushing fluid is removed and a steady stream of new adhesive flows.
12. Re-adjust the pump air pressure for desired flow.
13. Re-fill the tank and resume production.


Chapter 7 TROUBLESHOOTING

General Troubleshooting Notes

Note: Re-read Chapter 1 “Safety Precautions” before performing any troubleshooting or repair procedures. All troubleshooting or repair must be performed by qualified, trained technicians.

 DANGER HIGH VOLTAGE	 WARNING HOT SURFACE
<p>The Quattro ASU uses electrical power that can be life threatening and hot-melt adhesives that can cause serious burns. Only qualified persons should perform service on the ASU.</p>	

Handling Printed Circuit Boards (PCBs)

	DANGER HIGH VOLTAGE <p>Before unplugging connectors from the Control PCB, ground yourself to the ASU by touching any available unpainted cool metal surface, mounting screws, etc. This will avoid electrical discharge to the PCB assembly when you are removing and replacing connectors.</p>
--	---



CAUTION: Printed circuit boards (PCB) should be handled using the following procedures:

1. Wear a wrist grounding strap. If a grounding strap is not available, frequently touch a bare metal part of the ASU (unpainted frame, mounting screw, etc.) to safely discharge any electrostatic buildup on your body.
2. Handle a PCB by its edges only. Don't grip a PCB across its surface.
3. When removed from the ASU, the PCB must be packaged inside a metallized, static drain envelope. Do not place the removed PCB on a table, counter, etc. until it has first been placed in or on a static drain envelope.
4. When handing a PCB to another person, touch the hand or wrist of that person to eliminate any electrostatic charge *before* you hand the PCB to him.
5. When unwrapping a PCB from its static drain envelope, place the envelope on a *grounded, nonmetallic* surface.
6. To cushion a PCB for shipment, use only static-drain bubble pack. Do not use foam peanuts or bubble pack not known to be static draining.

Control Printed Circuit Board

Notes:

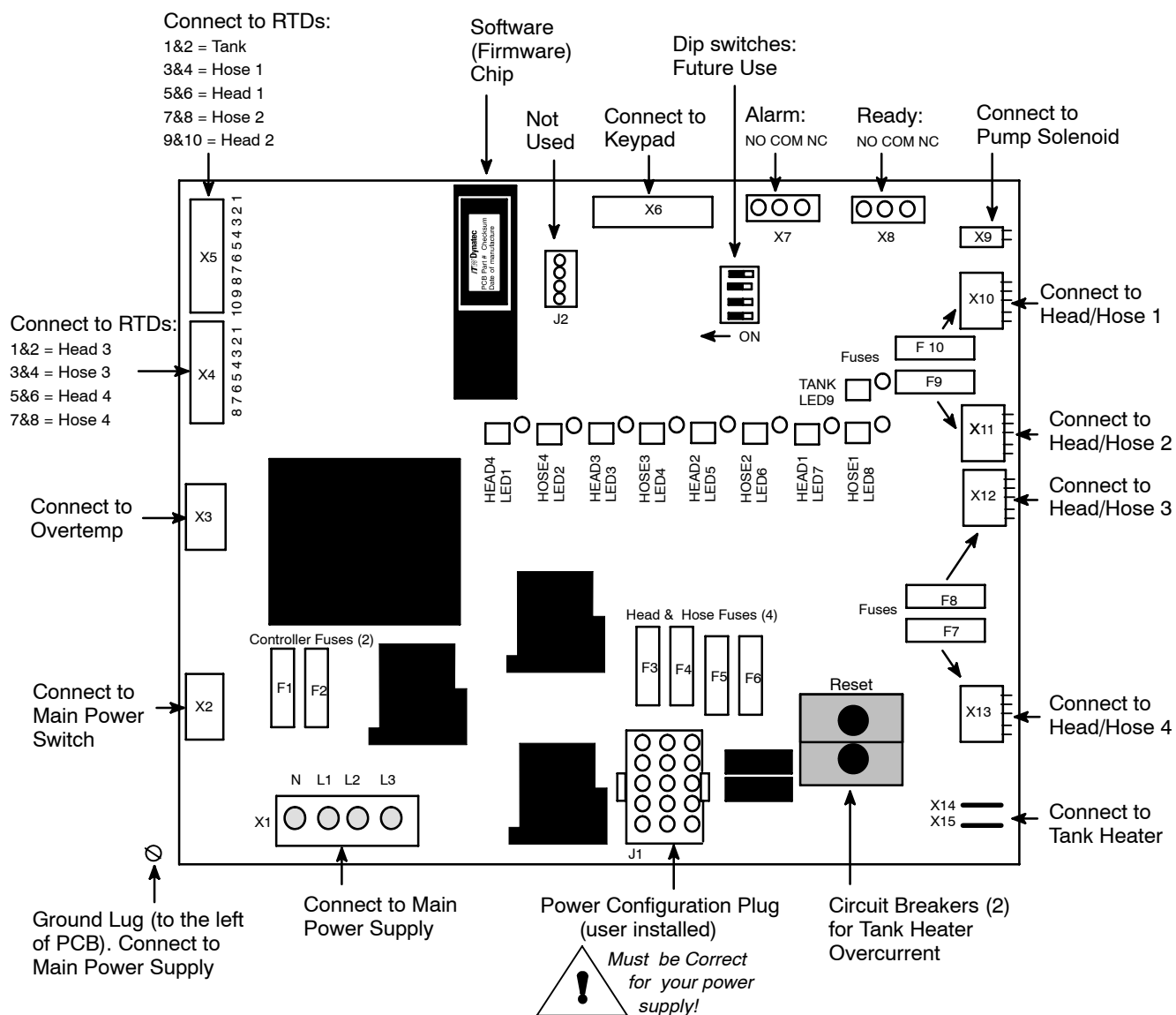
1. The green LEDs cycle on and off as each heater outputs.

2.  **CAUTION: Using the incorrect power configuration plug may cause serious damage to the unit.**

The Power Configuration Plug (user-installed) must be correct for your application or serious ASU damage will result. See Installation Chapter 3 for details.

3. If an overcurrent occurs on tank heater(s), its circuit breaker(s) must be reset by depressing one or both of the round breakers illustrated below.

4. Fuses 1 & 2 = 1 amp. Fuses 3 - 6 = 6.3AF amp, fast.



Overtemp Thermostat

The overtemp thermostat cuts off power to all temperature zones if the tank temperature exceeds 224°C (435°F). The overtemp thermostat must be re-set manually, by opening the ASUs front panel and pressing the reset button in the center of the overtemp switch (note: the reset button is protected by a plastic insulator).

Tank Overcurrent

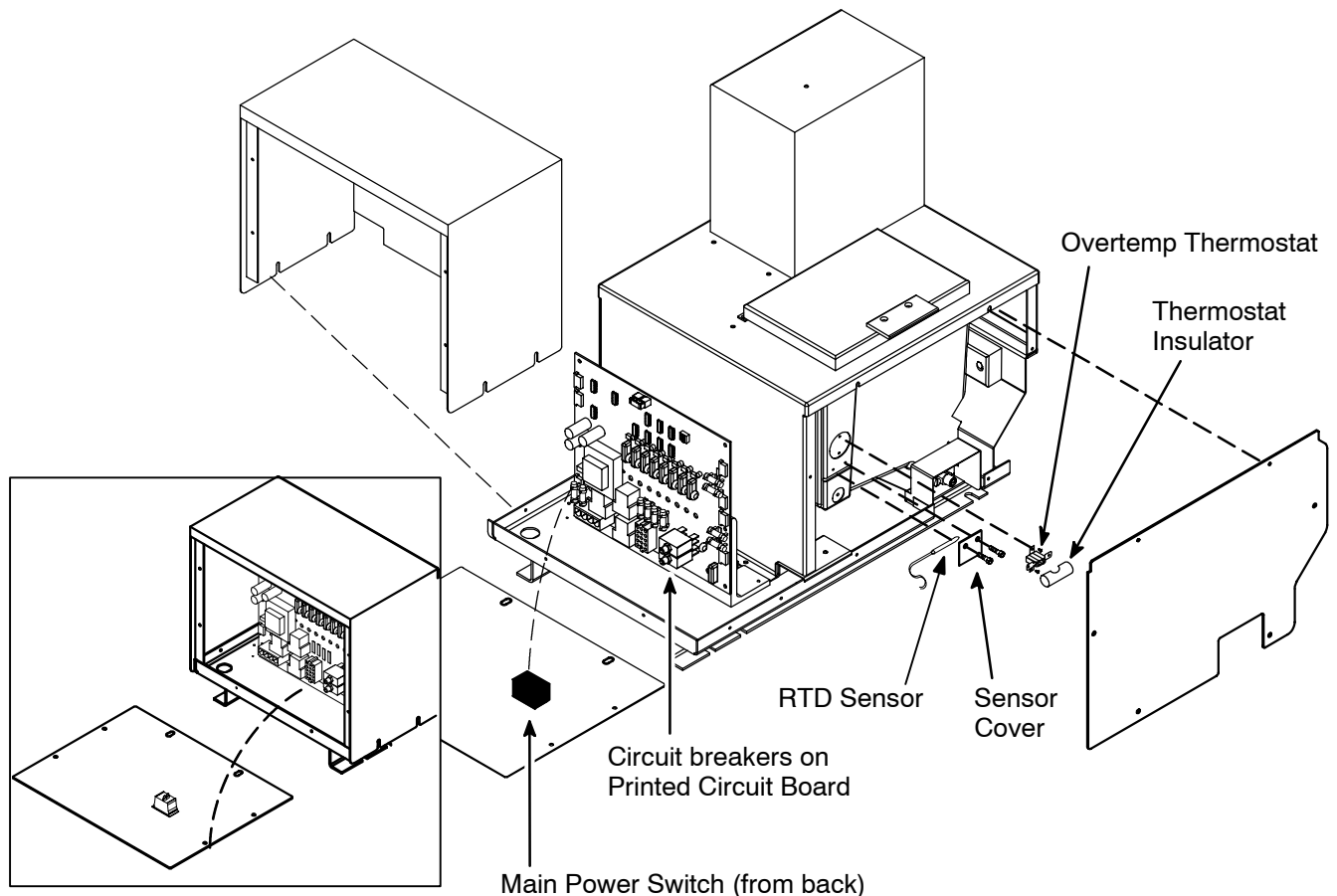
If only the power to the tank zone cuts off, the circuit breaker(s) on the printed circuit board must be reset. Either remove the control enclosure or the control panel face plate, locate the circuit breakers (see illustration on previous page), identify the one which has popped up and push it down, back into place.

Ready Contact to Parent Machine

A ready contact from the controller to the parent machine can enable the parent machine if it is connected on the control printed circuit board.

Temperature Zones Not Heating

If two temperature zones simultaneously cool down, the problem could be a bad fuse on the main PCB, as these fuses relate to hose/ head combinations. If only one temperature zone cools, the problem could be a bad heater or a PCB problem such as a PCB connection.



*Location of Printed Circuit Board and Circuit Breakers,
Overtemp Thermostat and RTD Sensor*

Resistance Tables

Temperature		Resistance in Ohms
°F	°C	
32	0	120.0
50	10	127.2
68	20	134.5
86	30	142.1
104	40	149.8
122	50	157.7
140	60	165.9
158	70	174.2
176	80	182.8
194	90	191.6
212	100	200.6
230	110	209.8
248	120	219.3
268	130	229.0
284	140	238.8
302	150	249.0
320	160	259.3
338	170	269.9
356	180	280.8
374	190	292.0
392	200	303.5
410	210	315.3
428	220	327.5

*Temperature Sensor Resistance
for Ni120 RTD*

Hose Length		Resistance in Ohms Nominal @ 240V
Meters	Feet	
1.2	4	467
1.8	6	287
2.4	8	228
3	10	177
3.7	12	144
4.9	16	108
7.3	24	67

*Nominal Hose Heater Resistance for
Challenger Hoses with Ni120 Sensor*

Watts	Resistance in Ohms Nominal @ 240V
200	288
270	213
350	165
500	115
700	82

Nominal Head Heater Resistance

Nominal Voltage	Resistance in Ohms
240	33.4 - 28.9

Tank Heater Resistance

Note: Resistance is measured at ambient temperature (20°C/ 68°F).

Troubleshooting Guide

Preliminary Checks: Verify the following before proceeding

1. The ASU is switched on.
2. The ASU is supplied with power.
3. The ASU is supplied with pneumatic air.
4. Pneumatic and electrical connections (including the power configuration plug) are correct.
5. Adhesive is in the tank and it has had time to melt.

Error Messages (see also Chapter 4)

- EO1 = temperature zone has an open sensor
EO2 = temperature zone has a shorted sensor

Hose/ Applicator Troubleshooting Tip

Hose or applicator problems can be isolated by electrically connecting the applicator and hose to an alternate socket on the ASU. If the malfunction goes with the applicator and hose, the problem will usually be in the applicator or hose that was moved. If the malfunction does not move with the applicator and hose, the problem is probably in the ASU.

Problem	Possible Cause	Solution
Controller setpoints are not adjustable.	<ol style="list-style-type: none"> 1. Main Power switch OFF. 2. Control PCB inoperative. 3. Keypad is locked. 	<ol style="list-style-type: none"> 1. Switch ON. 2. Replace Control PCB. 3. Unlock keypad (see Ch. 5 Programming)
All channels display error message or wrong actual temperatures.	Control PCB inoperative.	Replace Control PCB.
System is not working, display is OFF.	<ol style="list-style-type: none"> 1. Ribbon connector X6 or harness X2 is disconnected. 2. Board fuse (F1 or F2) on the PCB is inoperative. 	<ol style="list-style-type: none"> 1. Check connection. 2. Insert new fuse, if it blows, the Control PCB is inoperative.

cont.

Problem	Possible Cause	Solution
Actual tank temperature is higher than set-point (overtemp).	<ol style="list-style-type: none"> 1. Tank sensor not fully inserted. 2. Tank sensor inoperative. 3. Inoperative PCB. 	<ol style="list-style-type: none"> 1. Check tank sensor. 2. Replace tank sensor if resistance does not comply with resistance table. 3. Replace PCB.
Display for Tank = EO1.	<ol style="list-style-type: none"> 1. Plug connection X5 (1&2) on PCB is loose. 2. Temperature sensor inoperative. 	<ol style="list-style-type: none"> 1. Restore connection. 2. Replace sensor if resistance does not comply with resistance table.
Display for Tank = EO2.	<ol style="list-style-type: none"> 1. Tank sensor short circuit. 2. Short circuit at plug connection X5 on Control PCB. 3. Inoperative PCB. 	<ol style="list-style-type: none"> 1. Replace sensor if resistance does not comply with resistance table. 2. Check and eliminate short circuit. 3. Replace PCB.
Tank does not heat, but LED is ON.	<ol style="list-style-type: none"> 1. Circuit breaker has tripped on PCB. 2. Tank heater element is inoperative. 3. Disconnection in tank heater circuit. 4. Inoperative PCB. 	<ol style="list-style-type: none"> 1. Re-set circuit breaker and observe ASU. If it trips again, check for a short circuit in heater. 2. Replace tank if element's resistance does not comply with resistance table. <i>Note: remove lead wires from heater element when measuring resistance.</i> 3. Check and repair (see wiring diagram). 4. Replace PCB.

Problem	Possible Cause	Solution
Tank does not heat, and LED is OFF.	Inoperative PCB.	Replace PCB.
Hose (or Head) is not heating. Hose (or Head) LED on the PCB is ON.	<ol style="list-style-type: none"> 1. Loose plug connection on PCB. 2. Heating element inoperative. 	<ol style="list-style-type: none"> 1. Check connectors X10, X11, X12 and X13 and restore connection. 2. Check resistance and compare to resistance table on page 7-4. <ol style="list-style-type: none"> a. For head: if heater cartridge is inoperative, replace heater. b. For hose: if heating element is inoperative, replace hose.
Head & Hose are not heating	<ol style="list-style-type: none"> 1. Disconnection between ASU and Hose (or between Hose and Head). 2. Hose (or Head) fuse on the PCB is inoperative. 	<ol style="list-style-type: none"> 1. Check plug connections. 2. Insert new fuse. If fuse blows again, check for a short circuit in heater. Note: there are two fuses for each hose /head combination.
Hose (or Head) is not heating. Hose (or Head) LED on the PCB is OFF.	<ol style="list-style-type: none"> 1. Sequential heat-up may be active. 2. Inoperative PCB. 	<ol style="list-style-type: none"> 1. Check controller display at start up. Re-program if necessary. 2. Replace PCB.
Hose (or Head) actual temperature is much higher than setpoint.	<ol style="list-style-type: none"> 1. Inoperative Hose (or Head) triac on PCB (corresponding PCB LED is OFF). 2. Inoperative Hose (or Head) temperature sensor (corresponding PCB LED is ON). 	<ol style="list-style-type: none"> 1. Replace PCB. 2. Check resistance and compare to resistance table. <ol style="list-style-type: none"> a. For head: if sensor is inoperative, replace sensor. b. For hose: if sensor is inoperative, replace hose.

Problem	Possible Cause	Solution
Display for Hose (or Head) = EO1	<ol style="list-style-type: none"> 1. No Hose (or Head) is connected. 2. Disconnection between ASU and Hose (or between Head and Hose). 3. Disconnection at X4 or X5 on PCB. 4. Hose (or Head) sensor is inoperative. 	<ol style="list-style-type: none"> 1. Connect Hose (or Head) if needed. If not needed, ignore display. 2. Check plug connection. 3. Make proper connection. 4. Check resistance and compare to resistance table. <ol style="list-style-type: none"> a. For head: if sensor is inoperative, replace sensor. b. For hose: if sensor is inoperative, replace hose.
Display for Hose (or Head) = EO2	<ol style="list-style-type: none"> 1. Hose (or Head) sensor short circuit. 2. Short circuit in plug connection between ASU and Hose (or between Hose and Head). 3. Inoperative PCB. 	<ol style="list-style-type: none"> 1. Check resistance and compare to resistance table. <ol style="list-style-type: none"> a. For head: if sensor is inoperative, replace sensor. b. For hose: if sensor is inoperative, replace hose. 2. Make proper connection. 3. Replace PCB.

Piston Pump Troubleshooting Guide



WARNING HOT SURFACE & ADHESIVE

Some of the procedures in the following Troubleshooting Guide require working near hot adhesive. Be sure to wear protective gloves, safety glasses and clothing and use proper tools for handling hot melt components.

For pump disassembly instructions, see page 8-5.

Problem	Possible Cause	Solution
Pump Will Not Stroke	<ol style="list-style-type: none"> 1. No air pressure. 2. 3-way solenoid valve is closed. 3. Fault in compressed air fitting on ASU. 4. Adhesive not up to temperature. 5. Inoperative air cylinder 4-way valve. 6. Start-up time delay has not expired. 	<ol style="list-style-type: none"> 1. Verify system has been provided with at least 0.5 SCFM of air at 20-100 PSIG (.014 std. cubic meters/minute at 6.8 bar). 2. Verify that valve is properly connected (electrically) inside ASU. Verify that valve is properly connected to Air Control/ Filter Unit. Disconnect valve electrical leads and verify that air is passed through when 240 VAC is applied to the valve terminals. Replace valve if defective. 3. Inspect the system for improper connections, loose tubing or fittings, or kinked tubing. Repair or replace tubing or fittings as necessary. 4. Wait for setpoint to rise or re-program setpoint lower. 5. Remove 4-way valve. Inspect, clean and repair as necessary. 6. Wait for time delay or re-program time delay.
Pump Will Not Stroke, adhesive has melted.	Not all the system components (including hoses & heads) have attained "ready" condition.	Wait until all system components are ready, or adjust the temperature zone tolerances.

Problem	Possible Cause	Solution
Pump Quick-Strokes in Both Directions	<ol style="list-style-type: none"> 1. No adhesive in tank. 2. Adhesive too cold to flow into pump. 3. Adhesive used is too viscous. 4. Pump needs priming. 5. Large opening in system downstream of pump. 	<ol style="list-style-type: none"> 1. Verify that tank has an adequate level of hot melt adhesive. 2. Check temperature of the thermostat to make sure there has been enough time for the adhesive to rise to the hopper setpoint temperature. 3. Verify that adhesive selection and tank setpoint temperature are compatible and that both are appropriate for your application. 4. Prime the pump by first lowering the air pressure, then letting the pump cycle very slowly until primed. 5. Inspect system for open filter drain, disconnected or ruptured hose, or disconnected head. Repair as necessary.
Pump Quick-Strokes on the Forward-Stroke Only (shaft moving into pump body)	Inlet check valve blocked open.	Clean inlet check valve.
Pump Motion on the Forward Stroke (shaft moving into pump) is very slow or stopped.	Outlet check valve is blocked closed.	Clean outlet check valve.
Pump Quick-Strokes on the Reverse Stroke (shaft moving out of pump)	Outlet check valve is blocked open.	Clean outlet check valve.

Problem	Possible Cause	Solution
Low or Inconsistent Adhesive Output	1. Output filter clogged.	1. Remove and inspect filter screen. Clean or replace as necessary. See Chapter 6 "Preventive Maintenance" for procedure.
	2. Adhesive used is too viscous.	2. Verify that system components are at proper temperature and that selected adhesive is correct for your application.
	3. Blocked hose.	3. Inspect hose for kinks, internal plugs of debris or char (degraded adhesive). Clean or replace hoses as required.
	4. Blocked applicator heads.	4. Inspect heads for plugged nozzles, proper air valve operation or plugged filters. Clean or repair heads as needed.
	5. Pressure relief valve in output block is opening.	5. Verify that air supplied to pump is less than 6.8 bar (100 PSIG). If relief valve is opening with air pressure less than 6.8 bar (100 PSIG), remove pump and replace pressure relief valve.
Adhesive Leak at Manifold Drain	1. Manifold drain valve not tightly closed.	1. Close and tighten manifold drain valve.
	2. Manifold drain valve blocked open.	2. Remove drain valve assembly from output manifold, clean and re-install.

Chapter 8 DISASSEMBLY & RE-ASSEMBLY PROCEDURES

Disassembly Procedures

Note: Re-read Chapter 1 “Safety Precautions” before performing any disassembly procedures. All disassembly procedures must be performed by qualified, trained technicians.

When needed, cross-reference the exploded-view component drawings in Chapter 10 with each procedure in addition to the instructions and illustrations given in this chapter. Read the “Cautions” on page 8-6 before re-assembling the ASU.

Removing Access Panels and Covers

To Remove the Pump Cover (allows access to the pump)

1. Remove one screw in the top of the cover.
2. Lift the pump cover straight up and off of the ASU being careful of the ground wire on the inside of the cover.

To Remove the Front Panel (allows access to thermostat, heaters, RTD sensor)

1. Remove two screws on either side of the cover and two at bottom of panel on either side of the filter manifold.
2. Loosen the two top tank cover screws to release the front panel from the ASU, being careful of the ground wire on the inside of the cover.

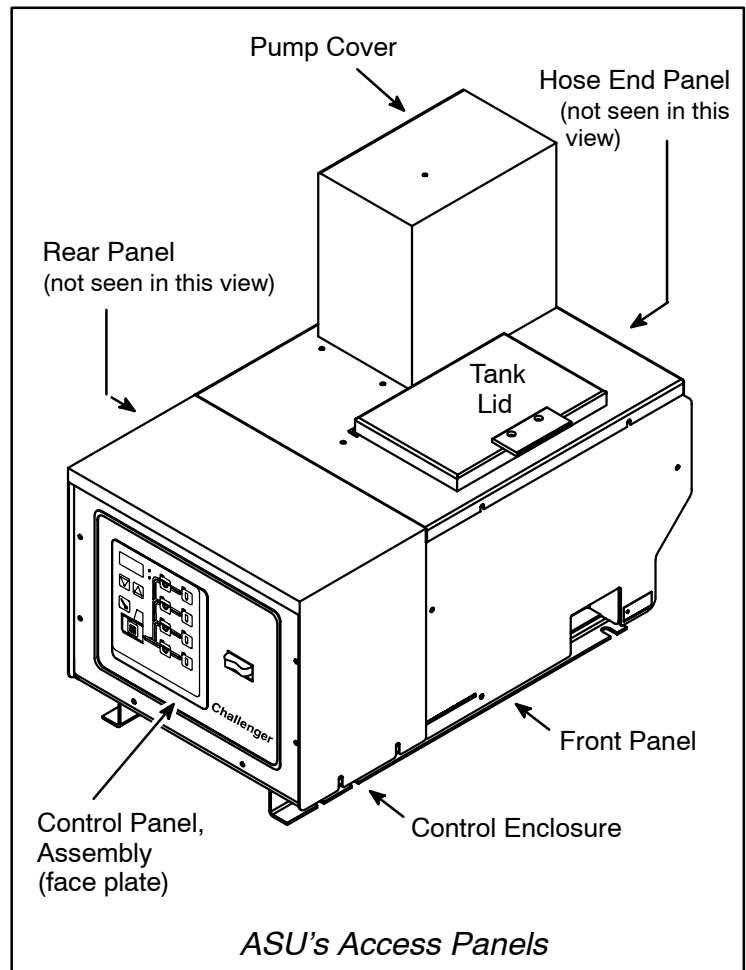
To Remove the Rear Side Panel (no serviceable components are behind this panel)

Remove in the same manner as the front panel, described above, being careful of the ground wire on the inside of the cover.

To Remove the Control Enclosure

(allows access to PCB and its connects, and the main On/Off switch)

1. Remove two screws from the bottom of each of the three sides of control enclosure.
2. Lift enclosure off, being careful of the ground wires on the inside of the cover plus the wires



which run from the keypad to the printed circuit board and the ones which run from the main switch.

To Remove the Control Panel Assembly

(allows access to PCB and its connects, and the main On/Off switch)

1. Remove the six screws around the face panel's outside edge.
2. Pull face plate straight out, being careful of the wires which run from the keypad to the printed circuit board, wires which run from the main switch to the PCB and the ground wire.

To Access Electrical Parts

Remove the front panel (see pg. 8-1) to access the following:

Thermostat Replacement

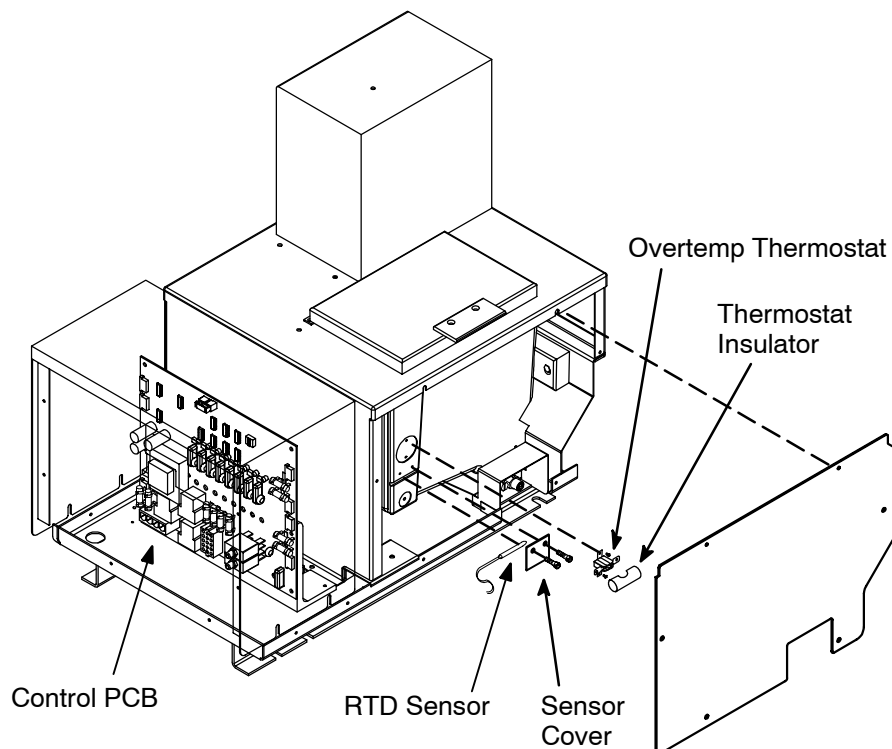
1. Pull out the two thermostat wires.
2. Remove the old thermostat.
3. Insert the two wires into the new thermostat.

RTD Sensor Replacement

1. Remove two screws to remove the plate.
2. Pull the sensor out of its groove.
3. Unplug the sensor wires from X4 or X5 on the control PCB (see PCB illustration in Chapter 7).
4. Connect new sensor wires to PCB, insert new sensor in groove in ASU.
5. Re-install plate with two screws.

Note on the Cast-in Heaters

The cast-in heaters installed in the base of the tank are not replaceable and will last the life of the ASU.



To Access the Control Panel Components

(See illustrations on pg. 8-1)

To remove the following components, remove the face plate of the control panel enclosure only.

Printed Circuit Board Fuse Replacement:

Note: Use replacement fuses of the same type. If in doubt, obtain the correct fuses from ITW Dyna-tec.

1. Locate desired fuse by referring to PCB illustration in Chapter 7.
2. Grasp fuse from both ends and pull out of the printed circuit board.

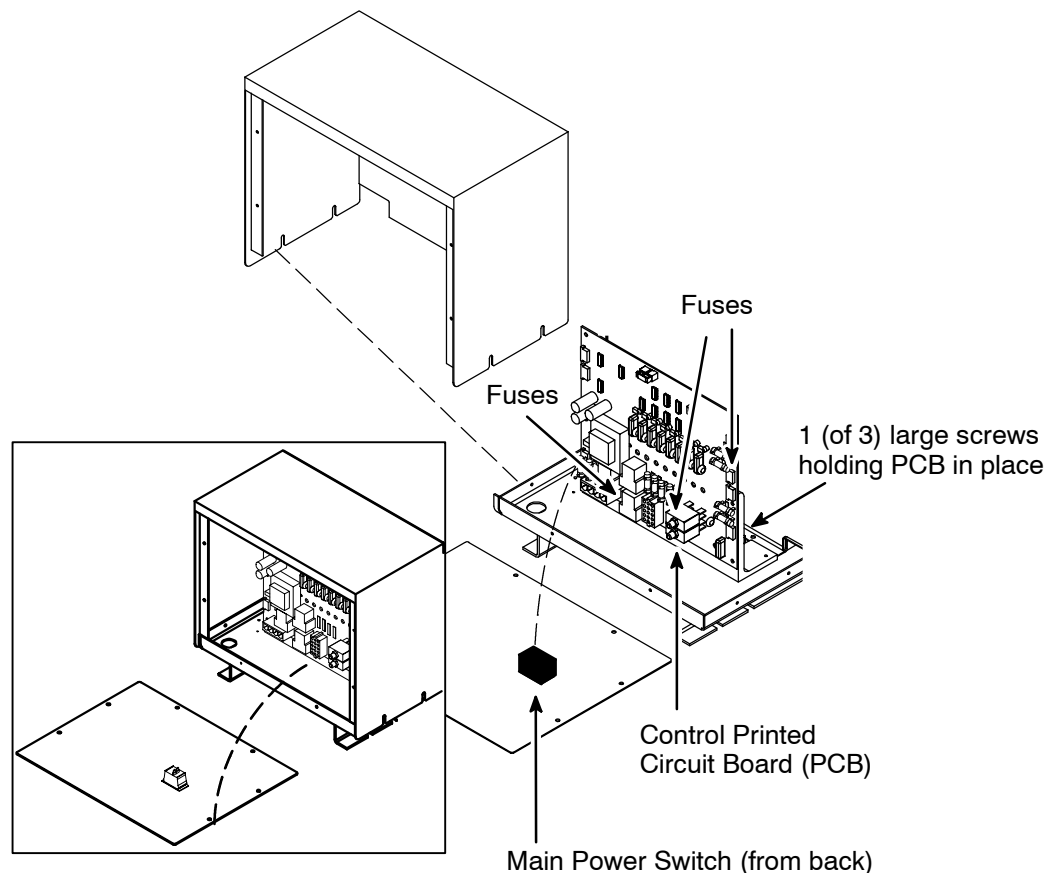
Main On/ Off Switch Replacement:

1. From the back of the switch, free it by squeezing it from either side.
2. Remove the switch through the back.
3. Disconnect four color-coded plug-in leads from the old switch and connect them to new switch.

To Remove the Control PC Board:

Reference the manual section entitled “Handling Printed Circuit Boards” on page 7-1 before proceeding.

1. Remove the control enclosure (see pg. 8-1).
2. Disconnect all electrical connections to the board.
3. Loosen the three large screws (behind the PCB) holding its heat sink and slide the PCB assembly out.



To Remove the Tank Lid

(see location on the illustration on page 8-1)

1. From one side of the tank lid, remove the two phillips flat head screws holding the tank lid hinge to the ASU.
2. Slide the tank lid in the direction of the removed screws to remove it.

To Remove/ Install the Tank Cover Seal

(for reference, use the illustration on page 10-3.) The tank lid seal is located under the sheet metal panels of the ASU.

1. Pump out as much of the molten adhesive as possible.



WARNING HOT SURFACE

The ASU will still be hot during this procedure. Use insulated gloves and protective clothing when handling components.

2. As described on page 8-5, unwire the pump solenoid and remove the manifold and pump.
3. Remove the machine's front and rear panels.
4. Remove the tank enclosure cover.
5. Remove the white insulation. Do not remove the blue insulation.
6. Gently pry off the old tank seal from around the tank opening.
7. Clean away any debris that may have accumulated under the old lid seal.
8. Fit the new lid seal around the tank opening.
9. In reverse order as described above, replace insulation, panels and top, pump and manifold. Re-wire the pump solenoid.

To Remove the Tank Pressure Relief

(see location on the illustration on page 10-10). The pressure relief is pre-set at the factory and is not adjustable.

1. Pump out as much of the molten adhesive as possible. See hot surface warning above.
2. Open the tank lid. Use a socket wrench to loosen and remove the pressure relief valve by turning it counter-clockwise.

PUMP DISASSEMBLY WARNINGS



HOT SURFACE

If the pump is not operable but the heating system will function, raise the temperature of the application system to the operating temperature to aid in the pump disassembly process. Otherwise, a controlled heating method is recommended to melt hardened hot melt adhesive. Never use a torch or an open flame on any of the components of the application system.



HIGH VOLTAGE

Once the system is up to temperature, disconnect and lockout all incoming power before proceeding.



HIGH PRESSURE

BEFORE PERFORMING ANY PUMP REPAIR, YOU MUST PURGE ALL ADHESIVE PRESSURE FROM THE ASU. Position a heat-resistant container under the filter manifold's drain valve. Carefully loosen the drain valve's screw and allow adhesive to escape. See page 6-1 for detailed instructions.

Piston Pump Removal

To Access the Pump

Remove the pump cover (see pg. 8-1)

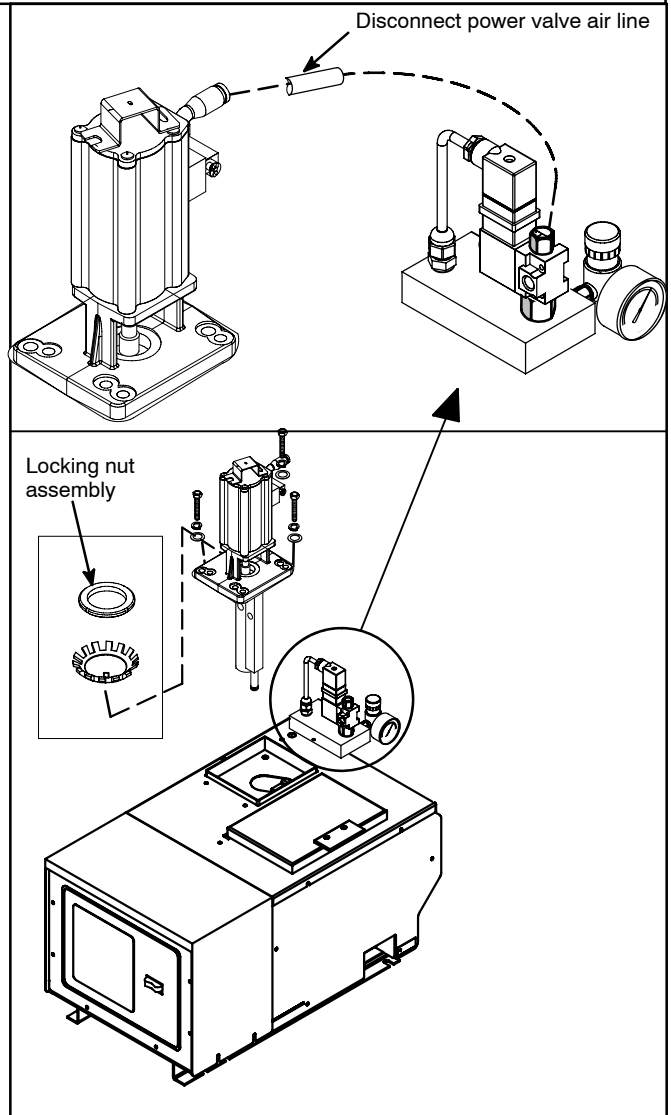
Removal from ASU

The ASU should be at operating temperature and the adhesive in its molten state (see warnings above).

1. Turn OFF air pressure, then disconnect the power valve's air line from the solenoid valve. Note: do not attempt to disconnect the power valve from the pump.
2. Remove the three mounting bolts that secure the pump assembly to the ASU.
3. Lift the pump up and out of the ASU.

Re-assembly notes:

- a. If installing a new pump, do not tighten the locknut that secures the pump body to the pump mount until after the pump is installed and the three 8mm hex head cap screws are installed and tightened. Tighten the locknut with a hammer and punch, then bend one tab of the lockwasher into a groove on the locknut's outer diameter.
- b. Torque the 3 pump mounting bolts to 22.6 Nm (200 in/lb) at room temperature. With pump and tank at 177°C (350°F), the maxi-



cont.

maximum allowable torque on these bolts is 44 Nm (32.4 ft/lb).

Pump O-ring Replacement:

1. Remove the pump assembly from the ASU (see previous instructions).
2. Remove the external pump seals (backup ring and o-ring) from their grooves on the end of the pump delivery tube.
3. Clean any debris from the seal groove.
4. Install the new seals.

Re-Assembly Procedures

Unless noted, the ASU's re-assembly is simply the reverse sequence of the disassembly procedures. However, the following "cautions" should be followed (whenever they apply) for proper re-assembly:



CAUTION: In general, all *O-RINGS AND SEALS* must be replaced whenever hot-melt equipment is re-assembled. All new o-rings must be lubricated with o-ring lube (PN 001U002).

CAUTION: *TAPERED PIPE THREADS* are found on air line fittings used with the pump air supply and on the outlet filter manifold. Apply thread sealant (PN N02892) whenever tapered pipe threaded parts are re-assembled.

CAUTION: *SOME FITTINGS* used for adhesive on the ASU have straight threads and o-ring seals. Use of thread sealant is not necessary with these parts, but the o-ring seals should be clean and lubricated. Tighten straight-threaded parts and fittings until their shoulders are firmly seated. Excessive torque may damage straight-threaded parts and the use of power wrenches is not recommended.

CAUTION: *HOT-MELT RESIDUE* must be cleaned from parts before they are re-assembled, particularly from threaded parts. As a precaution against adhesive residue preventing proper re-assembly, threaded parts must be re-tightened at operating temperature.

Chapter 9 RECOMMENDED SPARE PARTS & OPTIONS

Optional Accessories

PN 111243 Stand Assembly

This static Stand Assembly comes pre-drilled with front and back mounting plates for the installation of customer-selected auxiliary controls. Designed with square holes for carriage bolts that allow for one-wrench assembly. Assembly instructions enclosed.

Recommended Spare Parts List

Category	Part No.	Description	Qty.
Electrical:	110400	Control Printed Circuit Board Assembly	1
	108566	Fuse, 6.3 A/ Super Fst 5x20 (on PC Board)	8
	102762	Fuse, 1 amp (on PC Board)	2
	110720	Sensor Assembly, Tank	1
	104166	Over-Temperature Thermostat	1
	110747	Switch, DPDT	1
Filters:	CF1002	Filter Screen, 100 mesh	2
	110755	Tank Filter Screen	1
Misc:	N00186	O-ring -019, Viton (filter assy.)	1
	N00201	O-ring -116, Viton (filter assy.)	1
	N00177	O-ring -010, Viton (drain valve assy.)	1
	110717	Back-up Ring -010, Split TFE (drain valve)	1
	N00360	O-ring -906, Viton (hose fittings & plugs)	7
	N00188	O-ring -022, Viton (tank/ manifold)	2
	112292	Tank lid seal, silicone	1
	110907	Solenoid Valve, 3-way	1
	CA1008	Pressure Relief Valve	1
	110912	Mini Regulator w/ Gauge	1
	L15653	Kit, Flushing Fluid, 1 gallon	1
	001U002	O-ring Lubricant	1
	N02937	Thread Sealant, 1/4 oz	1
Kits:	111353	Output Manifold Seal Kit	1
	111354	Piston Pump Seal Kit, TP*	1
	111355	Piston Pump Air Valve Assembly Service Kit, TP*	1
	112128	Piston Pump Seal Kit**	1
	112127	Piston Pump Airmotor Service Kit**	1

* for Piston Pump PN 110756, manufactured before 7/05

** for Piston Pump PN 112129, manufactured after 7/05

Chapter 10

COMPONENT ILLUSTRATIONS & BILLS OF MATERIAL

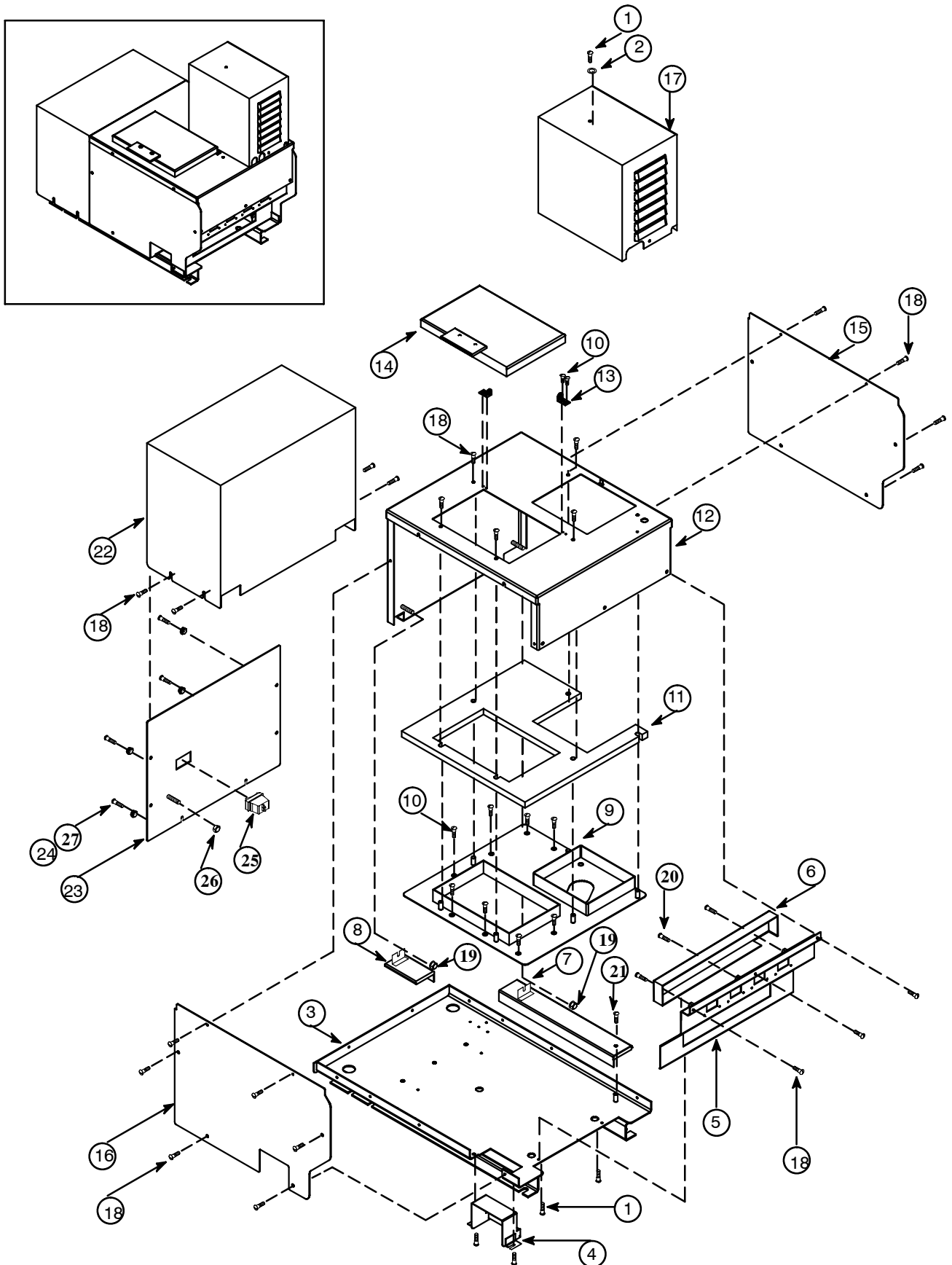


WARNING

All parts must be periodically inspected and replaced if worn or broken. Failure to do this can affect equipment's operation and can result in personal injury.

Bill of Materials for Cabinet Enclosure

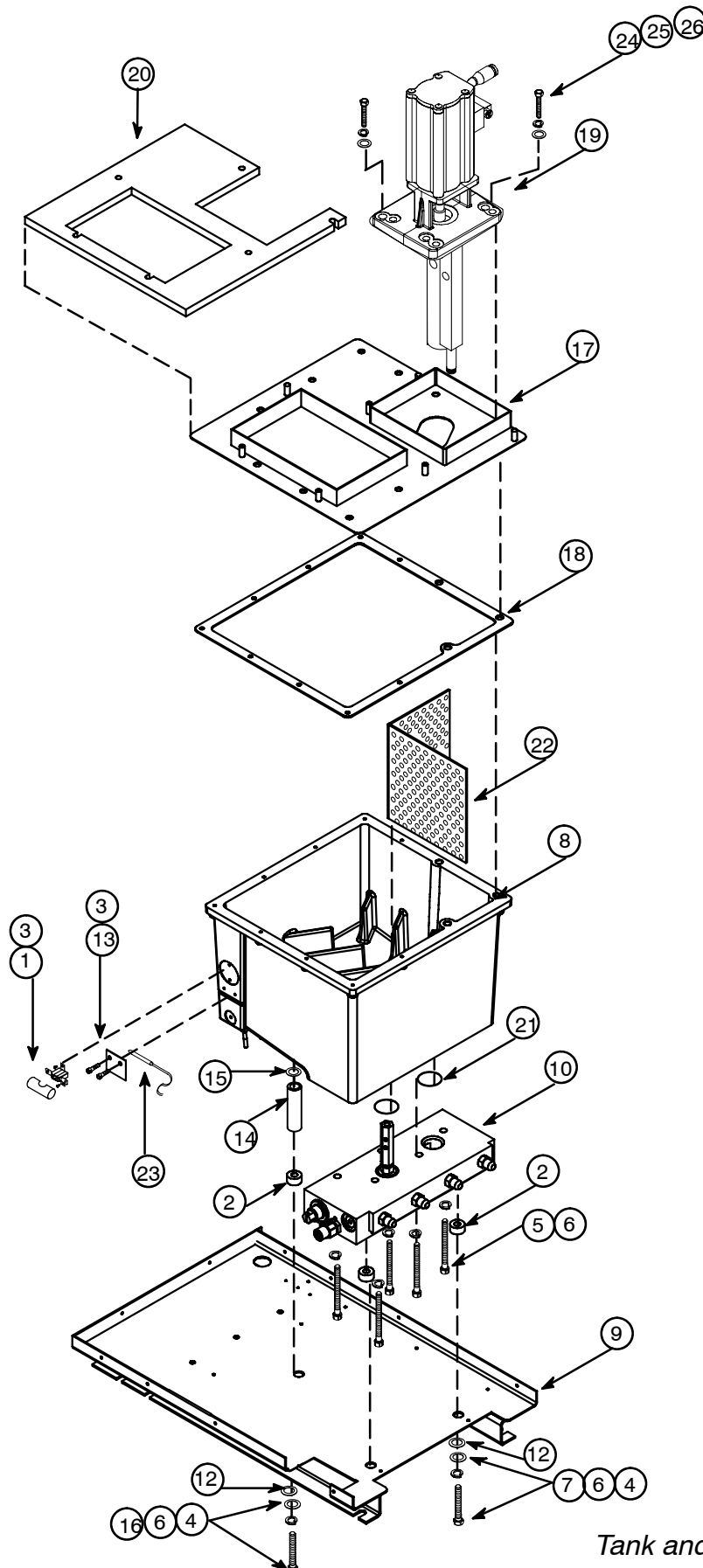
<i>Item No.</i>	<i>Part Number</i>	<i>Description</i>	<i>Qty.</i>
1	105117	M4 x 8mm, Zinc Plate, Pan Head Screw	3
2	106130	M4 Flat Washer, Nylon	1
3	110703	Base, ASU	1
4	110723	Filter Access Cover	1
5	110725	Hose End Panel	1
6	110727	Hose Socket Wireway Cover	1
7	110730	Rear Wireway Cover	1
8	110731	Front Wireway Cover	1
9	110733	Tank Cover	1
10	110734	M4 x 8mm Zinc Plate, Ph Flat Head (tank cover to tank, lid hinges)	13
11	110735	Tank Top Insulation	1
12	110736	Tank Enclosure Cover	1
13	110737	Tank Lid Hinge	2
14	110738	Tank Lid Assembly	1
15	110752	Rear Side Panel	1
16	110753	Front Side Panel	1
17	110754	Pump Cover	1
18	110771	M4 x 8mm Black Oxide Ph Pan Head Screw	30
19	107391	M4 x 0.7 nut, with ext. Lock washer	2
20	107389	Screw Ph Pan Head M4 x 8mm, Zinc Plate	5
21	105112	Screw, Hex Head, M4 x 10mm, Black	1
	110750	Control Enclosure Assembly	1
22	110751	Control Enclosure	1
23	110746	Control Panel Assembly	1
24	112073	M4 x 0.7 x 12mm black Oxide Ph Pan Head Screw	6
25	110747	Switch, DPDT, Rocker, Sealed	1
26	107391	M4 x 0.7 nut, with ext. lockwasher	1
27	112218	Washer, Finish, 08,Black Nylon	6
	110748	Cable Assembly, Keypad (Not shown)	1
	110749	Cable Assembly, Power Switch (Not Shown)	1
	110785	Ground Wire, Control Enclosure (not Shown)	1
	110774	Ground Wire, Control Panel (not Shown)	1



Component Illustration: Cabinet Enclosure

Bill of Materials for Tank and Base Assembly # 110702

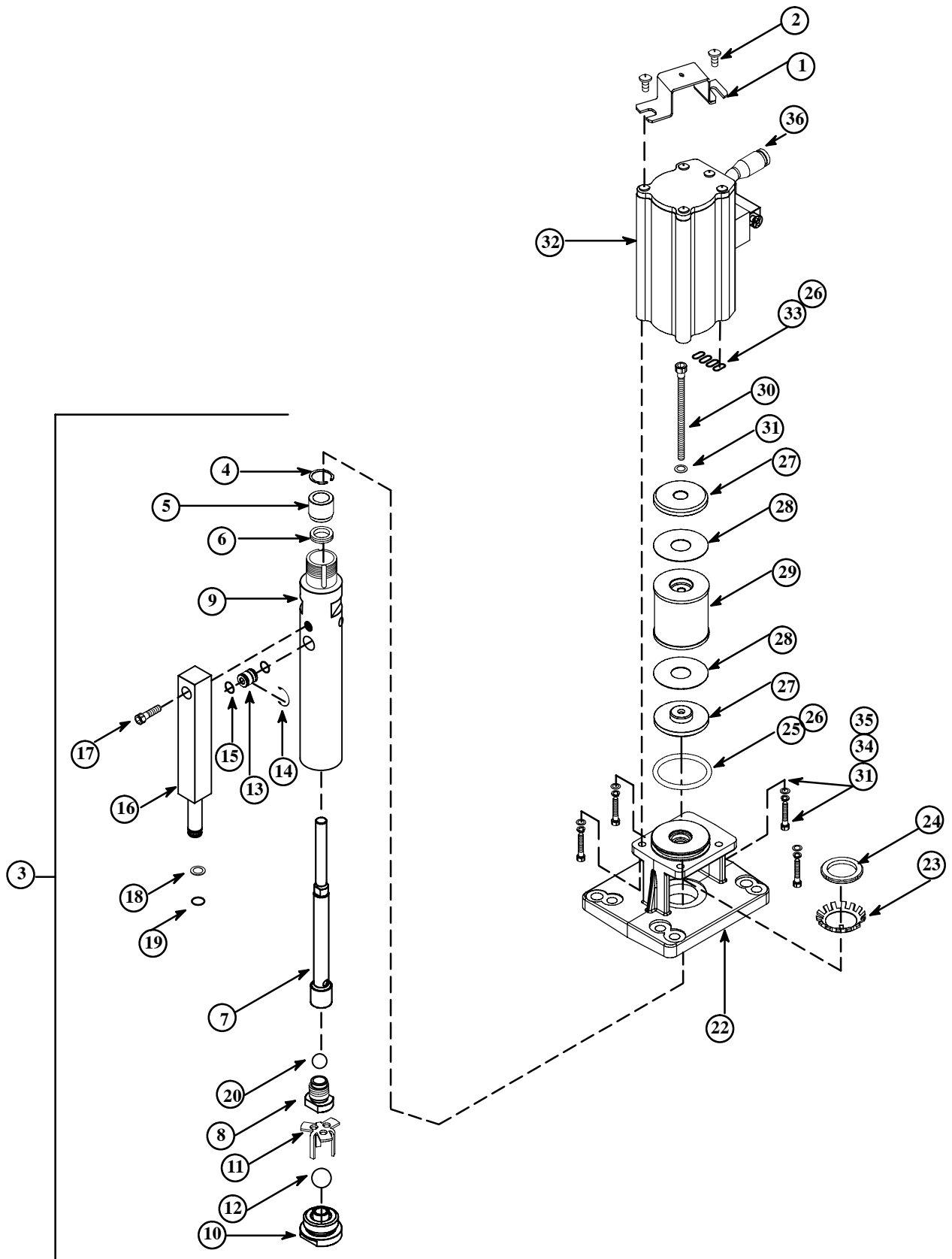
<i>Item No.</i>	<i>Part Number</i>	<i>Description</i>	<i>Qty.</i>
1	104166	Overtemp Switch Assembly	1
2	105134	Insulator-Spacer, .50	3
3	106137	M3 x 0.5 x 8mm, Black Oxide SHC Screw	4
4	106235	M8 Flat Washer	8
5	107341	M8 x 1.25 x 50mm, Black Oxide, SHC Screw	5
6	107346	M8 Split Lock Washer	3
7	107398	M8 x 1.25 x 35mm, Black Oxide Hex Hd Cap Screw	2
8	110382	Tank Assembly	1
9	110703	Base	1
10	110704	Manifold Assembly, Output	1
11	110722	Tank Insulation (not shown)	1
12	L00475	Washer Insulating, .328 x .750	3
13	110721	Plate, Clamp, Sensor	1
14	110718	Spacer, Tank Stand-off	1
15	110858	Washer, 52.2 x 9.9 x 1.07	1
16	110719	M8 x 1.25 x 75mm, Black Oxide HHC Screw	1
	110722	Tank Insulation Assembly (Not Shown)	
17	110733	Tank Cover	1
18	110732	Gasket Tank Top	1
19	111745	Pump Assembly (Shown For Ref. Only)	1
20	110735	Tank Top Insulation	1
21	N00188	O-ring, -022, Viton	2
22	110755	Screen, Tank Filter	1
23	110720	Sensor Assembly, Tank	1
24	106235	M8 Flat Washer (Shown For Ref. Only)	3
25	107346	M8 Split Lock Washer (Shown For Ref. Only)	3
26	107398	M8 x 1.25 x 35mm Hex Head Screw (Shown For Ref. Only)	3



Tank and Base assembly # 110702

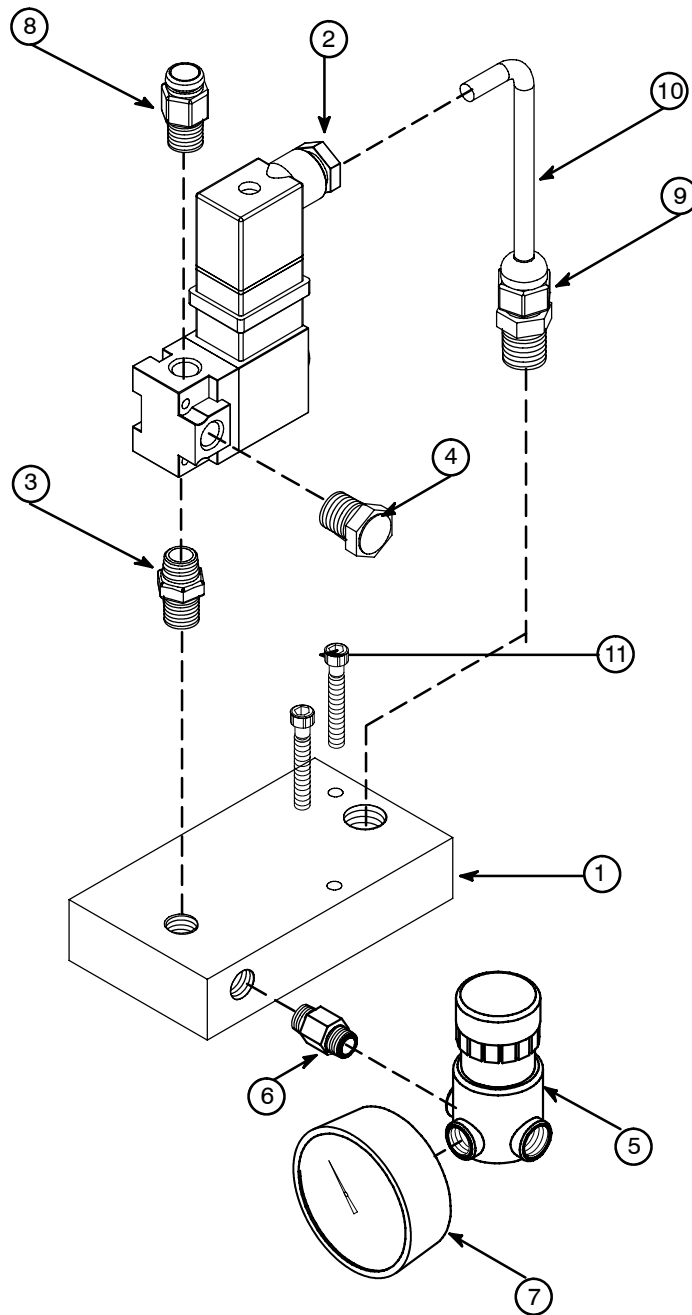
Bill of Materials for Piston Pump Assembly #111745

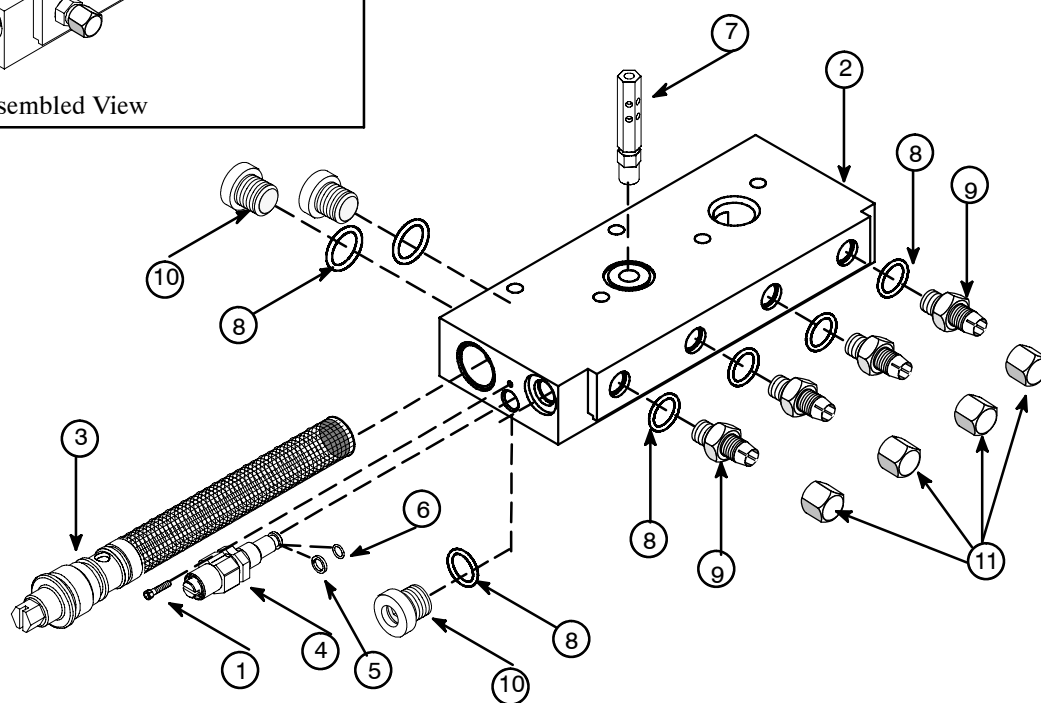
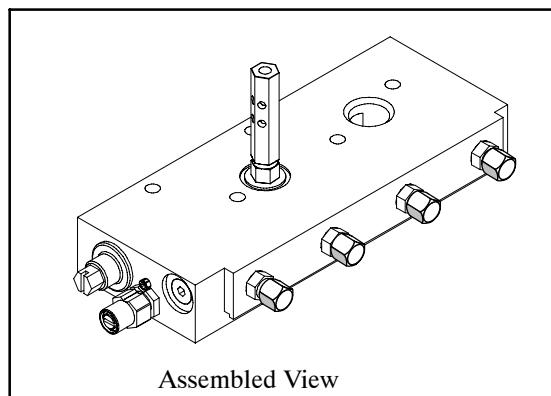
Item No.	Part Number	Description	Qty.
1	111746	Retainer Pump Cover	1
2	106324	Washer, Flat, M6, Zn, Pl	2
3	111738	Piston Pump Lower Assembly	1
4	111341	Retaining Ring, Inv, Internal, .875	1
5	111742	Bush, Seal Back Up	1
6	111348	Seal, Rod, 13.8 x 20 x 4.8	1
7	111740	Pump Shaft Assembly	1
8	111231	Seat, Ball, Outlet Check (Locktite required)	1
9	111739	Pump Body	1
10	111233	Seat, Ball Inlet Check (Locktite Required)	1
11	111234	Bearing Cage, Inlet Check	1
12	111340	Ball, SST, .469 Dia.	1
13	111432	Pump Transfer Tube Assembly	1
14	111338	Retainer Clip, Pump transfer tube (included with Item 13)	1
15	N00179	O-ring, Pump transfer tube, -012 (included with Item 13)	2
16	111236	Pump Delivery Tube	1
17	N07428	M8x 1.25 x 20mm (pump delivery tube mouning)	1
18	111346	-013, Split TFE	1
19	N00180	O-ring, -013	1
20	111339	Ball, SST, .312 Dia.	1
21			
22	11714	Pump Mount Assembly	1
23	111342	Washer, Bearing Lock, SKFMB6	1
24	111343	Nut, Bearing Lock, SKF KM6	1
25	N06006	O-ring, -224	1
26	108700	Lube, TFE, Krytox GPL206	
27	111715	Piston Cap	2
28	111716	Piston Lip Seal	2
29	111717	Piston Spacer	1
30	111743	M6 x 1 x 70mm, ZN Pl	1
31	111345	Washer, Split Lock, M6, ZN , PL	5
32	111718	Cylinder & Valve Assembly	1
33	N00178	O-ring, -011	4
34	105104	M6 x 1 x 25mm, Hex Head Screw, Zn Pl	4
35	106324	M6 Flat Washer	4
36	111720	Fitting Connector, 6mm, Tube Push-In x 1/8 NPT Male	1



Bill of Materials for Pump Air Manifold Assembly #111830

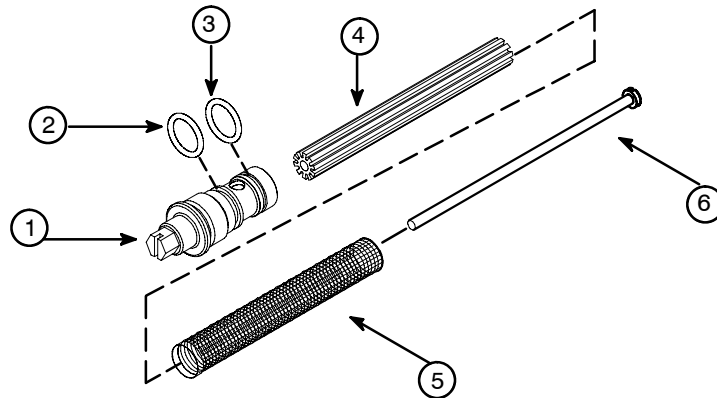
<i>Item No.</i>	<i>Part Number</i>	<i>Description</i>	<i>Qty.</i>
1	111829	Manifold, Pump Air	1
2	110907	Valve, Solenoid, 3-way, NC, 240VAC, 1/4 G	1
3	110906	Fitting, Hex Nipple, 1/4-19 R(BSPT), Brass	1
4	110908	Fitting Breather Vent, 1/4 R(BSPT)	1
5	110912	Regulator, Mini, 1/4 Rc(BSPT), w/Gauge	1
6	110910	Fitting, Hex Nipple, 1/4 - 19 R X 1/4G x 40mm, Brass	1
7		Gauge	1
8	110909	Fitting, Connector 1/4 R x 8mm, Push-In	1
9	109472	Fitting, Cable Clamp, PG09 x 24 DIA.	1
10	111135	Cable Assembly, Solenoid Valve	1
11	106421	M4 x 30mm SHC Screw (air manifold mounting screws)	2





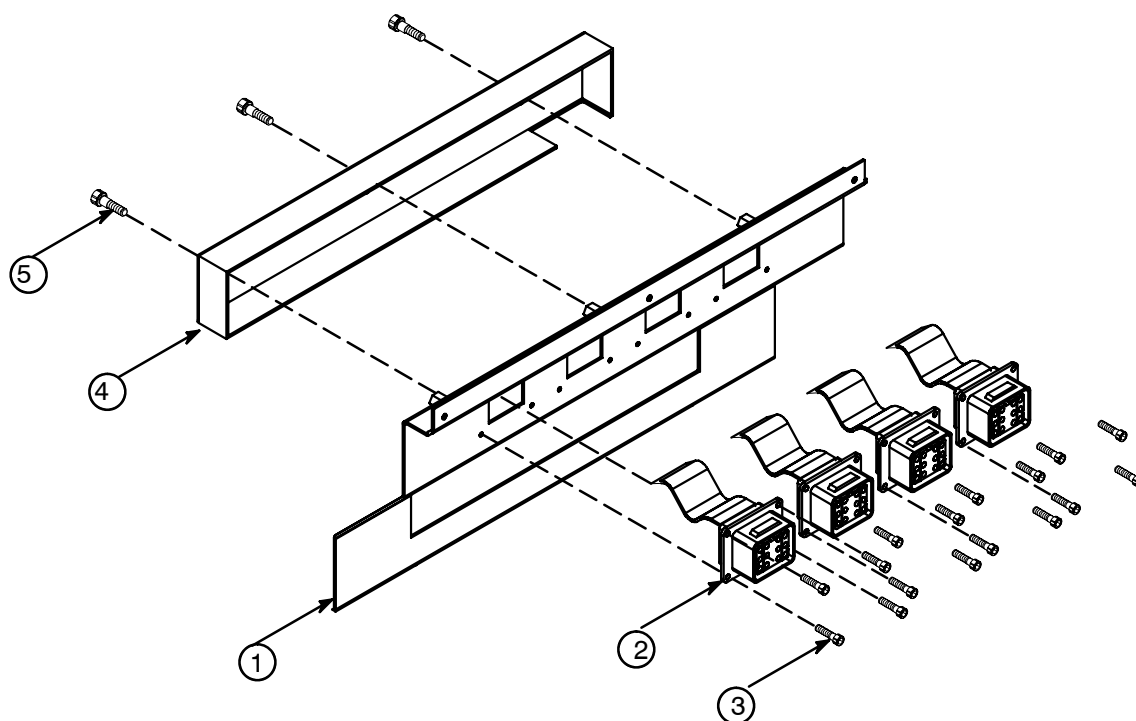
Bill of Materials for Manifold Output Assembly #110704

Item No.	Part Number	Description	Qty.
1	108350	M4 x 0.7 x 8mm SHC Screw	1
2	110705	Manifold, Output	1
3	110706	Filter Assembly	1
4	CA1007	Valve Assembly, Manifold Drain	1
5	110717	Ring, Backup, -010, Split TFE	1
6	N00177	O-ring, -010, 75 Duro Viton	1
7	CA1008	Pressure Relief Valve Assembly	1
8	N00360	O-ring, -906, Duro, Viton	7
9	N01831	Fitting Adapter, #06 37° x #06 St Thd ORS	4
10	N02040	Fitting Plug, Hex Socket, #06 St Thd ORS	3
11	N08024	Fitting Cap, #06 37° SAE	4
12	001V078	Lube, TFE, Krytox GPL206 (not shown)	
13	N02937	Sealant, Thread, W/ TFE (not shown)	



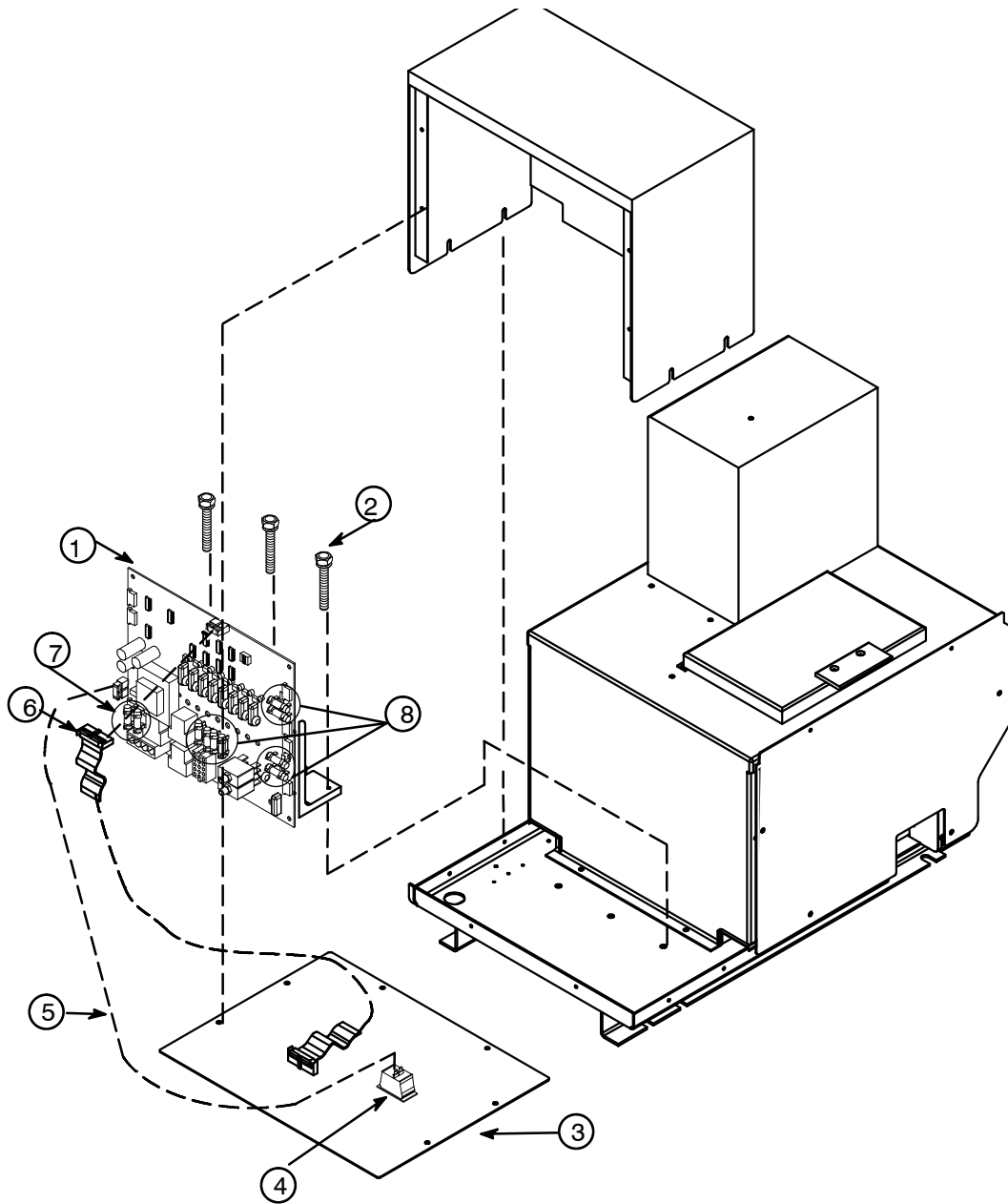
Bill of Materials for Filter Assembly #110706

Item No.	Part Number	Description	Qty.
1	110707	Bung, Filter	1
2	N00201	O-ring, -116, 75 Duro Viton	1
3	N00186	O-ring, -019, 75 Duro Viton	1
4	CF1001	Support, Filter, 5.718 Lg	1
5	CF1002	Screen, Filter, .006 Mesh, 5.39 LG	1
6	CF1003	M5 x 160mm Slotted Pan Head Screw, Zinc Plated	1
7	107324	Anti-Seize, Compound (not shown)	
8	001V078	Lube, TFE, Krytox (not shown)	



Bill of Materials for Valve Hose End Panel Assembly #110724

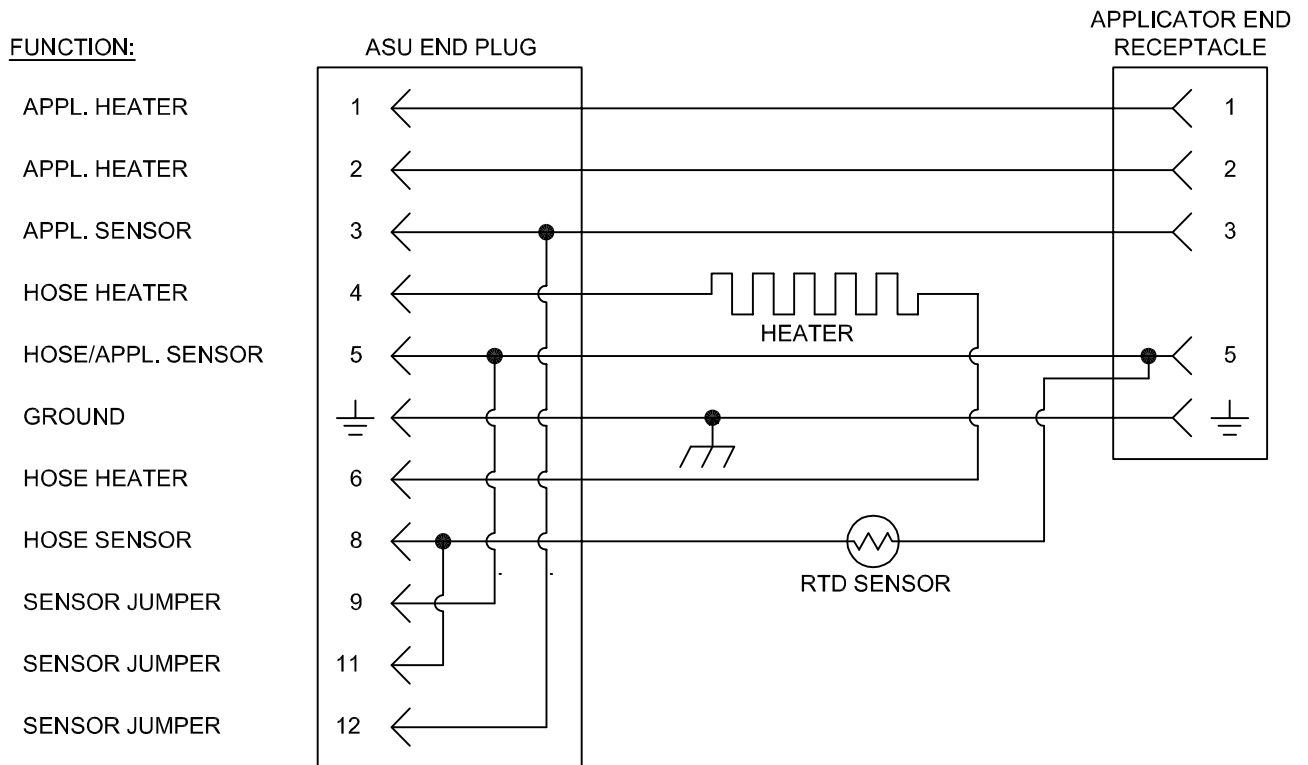
Item No.	Part Number	Description	Qty.
1	110725	Panel, Hose End	1
2	110726	Harness Assembly	4
3	104898	M3 x 0.5 x 10mm Socket Button Head Screw, Black	16
4	110727	Cover Wireway	1
5	107389	M4 x 0.7 x 8mm, PH Pan Head Screw with Lockwasher, Zinc Plate	3



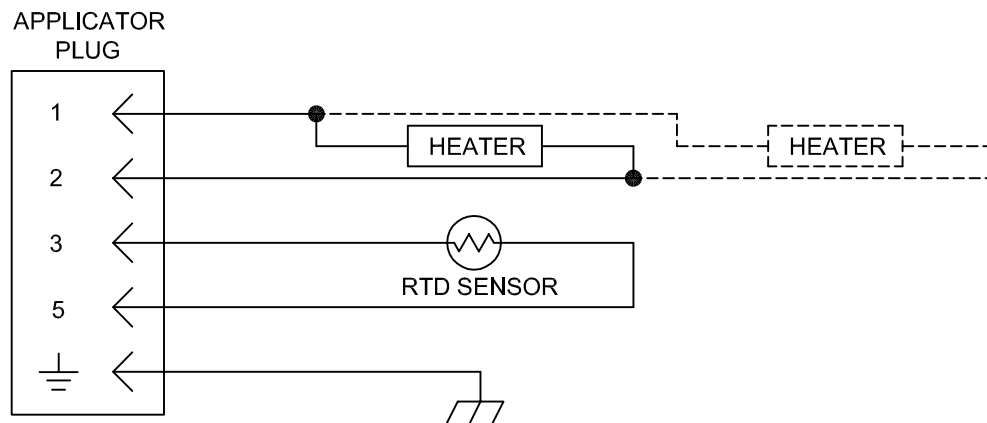
PCB/ Heat Sink To Base

Item No.	Part Number	Description	Qty.
1	110743	PCB/ Heat Sink Assembly	1
2	108297	M8 x 20mm, Hex Flange Head Screw	3
3	110746	Control Panel Assembly	1
4	110747	Switch,DPDT, Rocker	1
5	110749	Cable Assembly, Power Switch	1
6	110748	Cable Assembly, Keypad/ Display	1
7	102762	Fuse,5 x 20, 1.0A, Fast	2
8	108566	Fuse, 5 x 20, 6.3A, Very Fast	8

Chapter 11 SYSTEM SCHEMATICS & ENGINEERING DRAWINGS



SCHEMATIC, CHALLENGER HOSE
WITH 120 OHM Ni SENSOR



SCHEMATIC, CHALLENGER APPLICATOR
WITH 120 OHM Ni SENSOR

